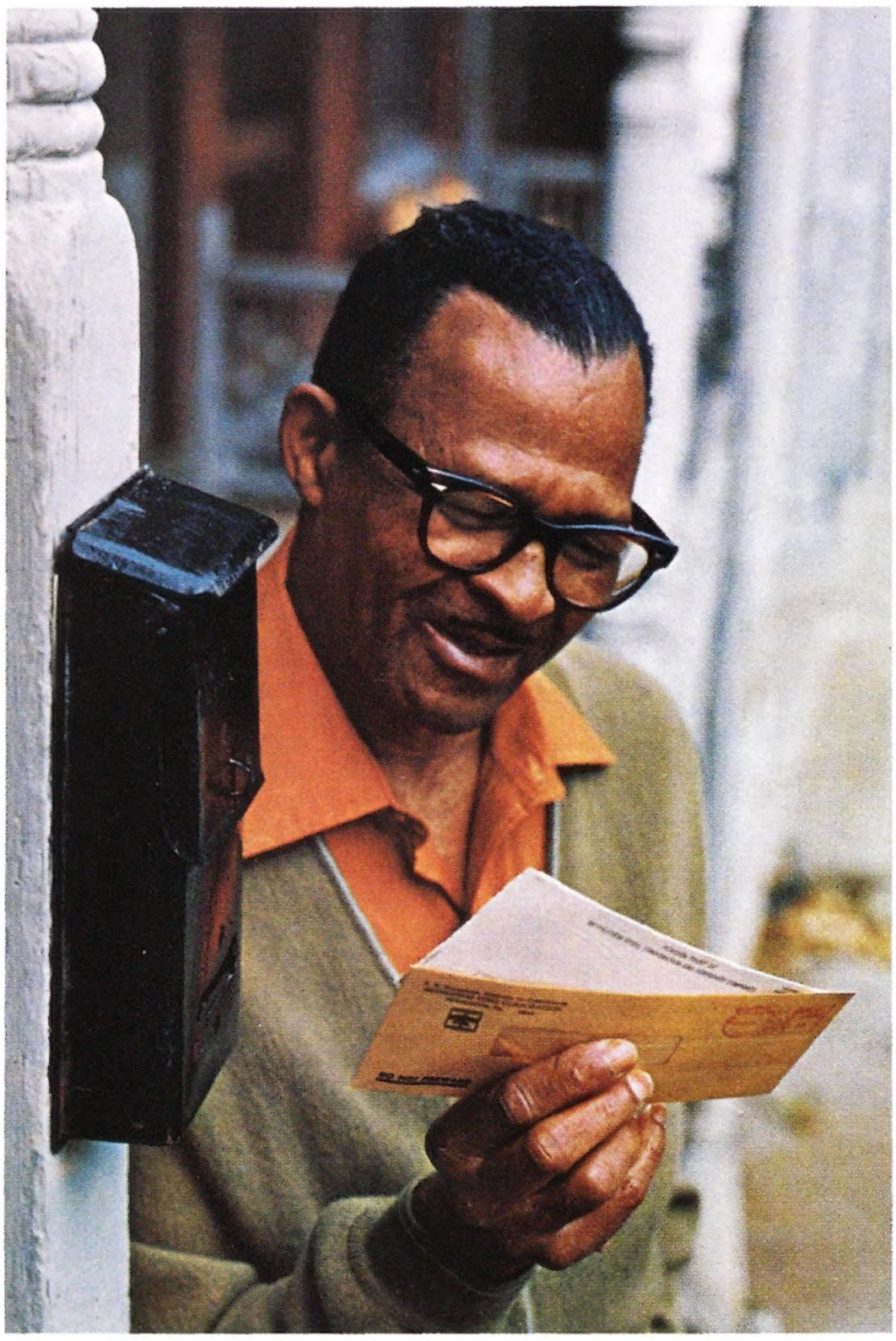
May 1975

Smithsonian

Trinidad's spectacular scarlet ibis may be heading for trouble (p. 34)

35,139 retired people depend on pension checks from Bethlehem Steel



Bob Jenkins's monthly pension check from Bethlehem Steel will arrive as regular as clockwork. Bob owns his home in Bethlehem, Pa. He's a Trustee of his church, and a member of the Elks. Bob expects "to travel more than I've been able to, visit my two married daughters and their families, and do a lot more of my favorite hobby—bowling."

Bob Jenkins is one of them

Bob Jenkins started at our Bethlehem, Pa., steel plant as a chipper in the billet yards.

When Bob decided last September to retire, he'd advanced to temporary foreman. He was a valuable member of our work force for forty years.

Now Bob's a member of another Bethlehem Steel "family"—our *retirement* family. It's 35,139 members strong at this writing and growing every year. In 1974, for example, 3,521 Bethlehem employees retired and are now receiving their monthly pension checks.

Bethlehem's pension plan was established in 1923 and has been expanded and improved many times since then. In the past 52 years, over $782,000,000 has been paid to more than 66,500 pensioners. In 1974, our payments to pensioners totaled more than $105,000,000, including monthly payments made to almost 2,400 co-pensioners and surviving spouses.

In simple terms, the American Dream is to work at the job of your choice, retire, and be financially independent to live in comfort and dignity. Private pension plans, such as Bethlehem's, help to make that dream come true.

Bethlehem BETHLEHEM STEEL

THE FLYING HORSE OF KANSU

Perhaps the most remarkable piece of sculpture discovered by archeologists in recent times, the Flying Horse of Kansu is the keystone of the first Western exhibition of ancient art from the People's Republic of China. It has already found a permanent place among the great art treasures of the world.

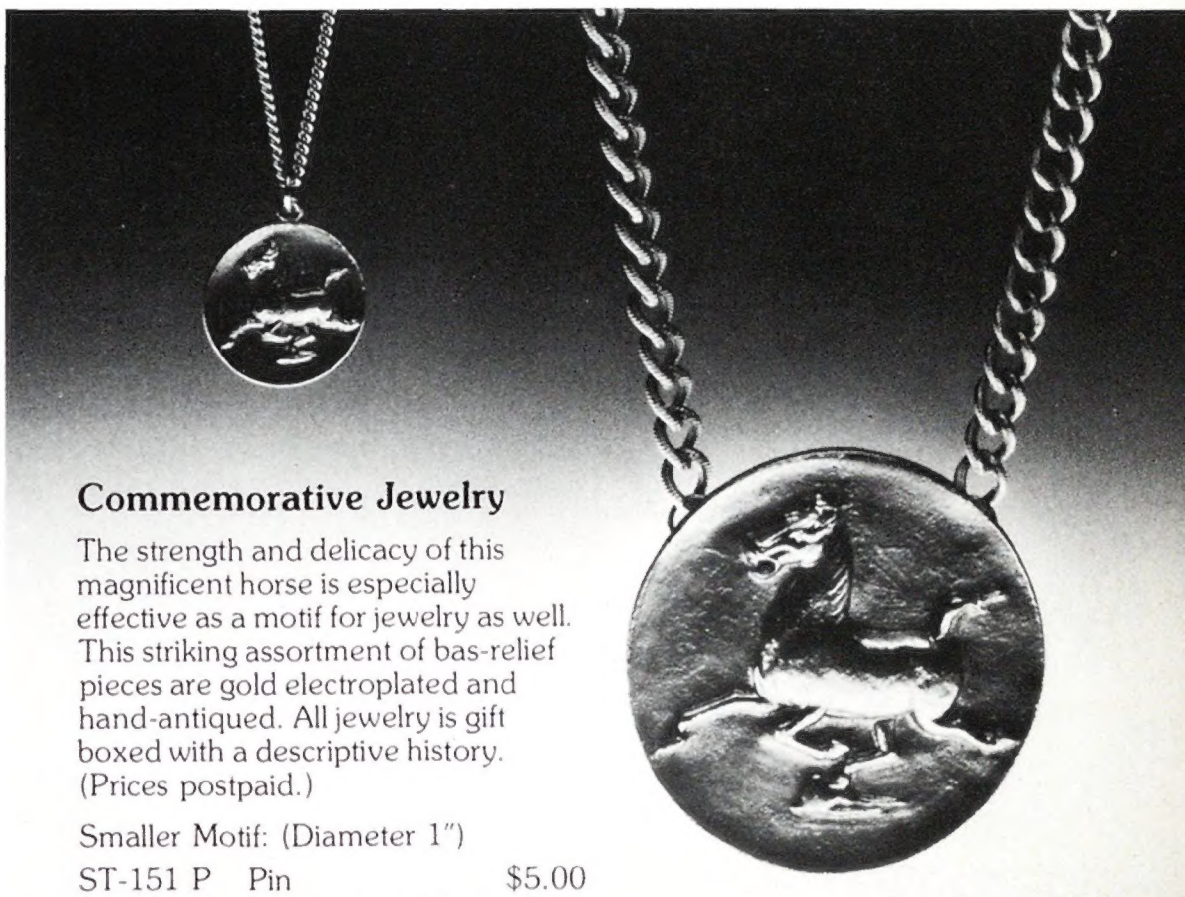
Blending poetry and art as only the Chinese could, this "celestial" horse is depicted with one hoof poised on the back of a swallow—an aerial stepping stone on its journey through the heavens.

A Limited Edition by Alva Museum Replicas

Alva Museum Replicas, in conjunction with the *Times of London*, has created a special limited edition of 750 copies in cold-cast bronze to be offered in the United States.

Balanced on a heavy Plexiglas base, the cold-cast bronze replica is slightly smaller (10⅛" high by 12" long) than the original. Each piece is hand-cast and finished to recreate the spirit, form and patina of the original in a truly remarkable likeness.

Each piece is individually numbered (on the base) and the certificate of ownership for each will be registered with the *London Times*. When the American edition is completed, all molds will be destroyed. Order #ST-1000 Price: $500. Postpaid. (Subject to prior sale)



Commemorative Jewelry

The strength and delicacy of this magnificent horse is especially effective as a motif for jewelry as well. This striking assortment of bas-relief pieces are gold electroplated and hand-antiqued. All jewelry is gift boxed with a descriptive history. (Prices postpaid.)

Smaller Motif: (Diameter 1")

ST-151 P	Pin	$5.00
ST-151 N	Pendant on Chain	7.00
ST-151 B	Chain Bracelet	7.00
ST-151 EC	Button Earrings	7.00
ST-151 ES	Drop Earrings	7.00
ST-151 CL	Cufflinks	7.00
ST-151 TC	Tie Clip	5.50
ST-151 R	Ring	5.50

Larger Motif: (Diameter 2⅝")

ST-150 N	Pendant on Chain	$10.50
ST-150 BK	Belt Buckle	9.00

TO ORDER BY MAIL, be sure to indicate complete style number. New York residents add sales tax. No COD. We will replace or refund within three weeks if not satisfied. (Allow 3 to 4 weeks for delivery.)

Send 50c for full color illustrated Museum Collections catalog.

MUSEUM COLLECTIONS

DEPT. S, BOX 999, RADIO CITY STATION, NEW YORK, NEW YORK 10019

Secretary of the Smithsonian Institution
S. Dillon Ripley

Editor Edward K. Thompson

Board of Editors Ralph Backlund, Grayce Northcross, James K. Page jr., Edwards Park

Associate Editors Marlane Liddell, Louise MacDonald, Bennett Schiff, John P. Wiley jr.

Picture Associate Caroline Despard

Assistant Editors Joyce McCarten, Dee McRae, Donna Reifsnider, Meredith Riegle

Art Direction John Beveridge

Advertising Director Thomas H. Black

General Manager Joseph J. Bonsignore
Production Nannie Clay Shanahan
Business Carey O. Randall

Circulation-Promotion Director Anne Keating

Board of Regents
Smithsonian Institution

Ex Officio

Chief Justice of the United States
Warren E. Burger, Chancellor
Vice President of the United States
Nelson A. Rockefeller

Appointed by the President of the Senate

Honorable Henry M. Jackson
Honorable Frank E. Moss
Honorable Hugh Scott

Appointed by the Speaker of the House

Honorable Elford A. Cederberg
Honorable George H. Mahon
Honorable Sidney R. Yates

Appointed by a Joint Resolution of Congress

Mr. John Paul Austin
Dr. John Nicholas Brown
Dr. William A. M. Burden
Dr. Robert F. Goheen
Dr. Murray Gell-Mann
Dr. Caryl P. Haskins
Honorable A. Leon Higginbotham jr.
Mr. Thomas J. Watson jr.
Mr. James E. Webb

National Board of the Smithsonian Associates

Mr. Lewis A. Lapham, Chairman,
Mr. Harry Hood Bassett, Mr. John W. Brooks,
Mr. Richard P. Cooley, Mr. Joseph F. Cullman 3rd,
Mr. Harry B. Cunningham, Mr. Paul L. Davies,
Mr. Leonard K. Firestone, Mr. Charles T. Fisher III,
Mr. G. Keith Funston, Mr. Alfred C. Glassell jr.,
Mrs. David L. Guyer, Mr. Ben W. Heineman,
Mr. Henry J. Heinz II, Mr. William A. Hewitt,
Mr. Frank Y. Larkin, Hon. George C. McGhee,
Mrs. Robert S. McNamara, Dr. Ruben F. Mettler,
Mr. Charles M. Pigott, Mrs. Malcolm Price,
Mr. Francis C. Rooney jr., Mr. Merritt K. Ruddock,
Mr. Thomas J. Watson jr., Mr. James O. Wright

Smithsonian is published monthly by the Smithsonian Associates, 900 Jefferson Drive, Washington, D.C. 20560. © Smithsonian Institution 1975. All rights reserved. Reproduction in whole or in part without permission is prohibited. Subscription price $10 a year in U.S. and possessions, $12.50 elsewhere. Single copy price $1.00. Second-class postage paid at Washington, D.C. Editorial offices, 900 Jefferson Drive, Washington, D.C. 20560. Advertising and circulation offices at 420 Lexington Ave., New York, New York 10017. Please address all subscription correspondence and change of address information to P.O. Box 5300, Greenwich, Conn. 06830

May 1975

Smithsonian

Volume 6, Number 2

Table of Contents

COVER: A flock of threatened scarlet ibis, one of nature's most exotic sights, wing toward their roost in Trinidad's Caroni Swamp (p. 34)
Photograph by George Silk

6 The view from the castle: Secretary Ripley talks of the diversity celebrated at Smithsonian's folk festival and its lessons for nationalism and internationalism

8 Letters to the Editor

20 Phenomena, comment and notes: Good news and bad in the energy business, and the tornado connection with traffic

28 On the Mall and beyond

34 In Trinidad, conservationists battle nationalized gas plant to preserve the scarlet ibis and other birds
Text by Timothy Green, photographs by George Silk

42 Probably a last look at the body of St. Francis Xavier, long venerated for its "incorruptibility" but now showing signs of time's wear and tear
Text by Madhur Jaffrey
Color photographs by Jehangir Gazdar

50 The story-telling statuettes of John Rogers, 19th-century people's artist, are being eagerly collected again
By David Bourdon, color photographs by Yale Joel

60 Some new and ingenious techniques may remodel the bathroom and save resources on a large scale
Text by Sam Love, drawings by John Huehnergarth

68 Treasure-diving Teddy Tucker still builds a legend scouring the wreck-strewn reefs of Bermuda
Text and photographs by Peter Stackpole

74 The ancient and noble art of puppetry probably preceded live performances on the stages of the world
Text by John Bernard Myers, photographs by Nina Leen

82 Alvin Weinberg, who has devoted his life to the peaceful atom, still finds it our best answer, but some circles consider him one of the bad guys
By Daniel Jack Chasan

90 The newsreels of yesterday had the kwaziest stunts—monkeys, football, battleships and Paris fashions
By Desmond Smith

99 Smithsonian tours

100 Book reviews

108 Additional reading

110 May events at the Smithsonian

116 Adam bombs, moon dust, doom buggies
By H. Allen Smith

THIS BOOK WILL MAKE YOU WANT TO LEAVE THE COUNTRY.

It's Air Canada's summer travel brochure.

Open it up, and feel the salty spray against your face as you look over a Nova Scotian seascape.

Turn the page and you're confronted by the crystal clear glacier lakes, deep pine forests, frosty ice fields and majestic mountain passes of the Canadian West.

Turn another page and you're transported back to another century. Where the clip-clop of horse's hooves on the cobblestoned streets echoes among the turrets of Québec City, the only walled city in North America.

Yet another page, and Shazammm! You're blasted back into the 20th century, kicking up your heels and blowing your mind in a hard-driving Toronto discothèque.

It's Canada. And once you're there, you can take our tours anyway you want. Escorted. Semi-escorted. Independent. With car. Without car. By train. By foot. By plane.

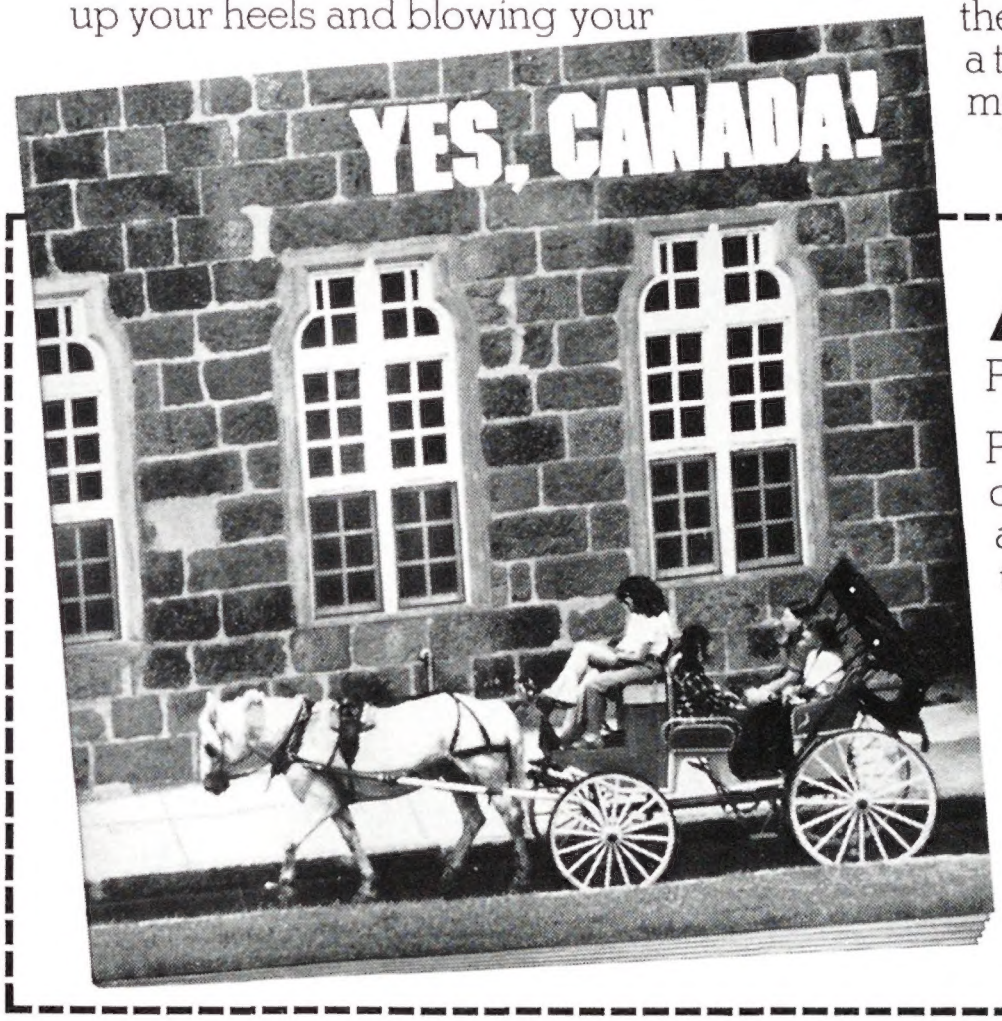
You can travel around a lot. A little. Or just groove in one place.

Another thing. Although Canada has a lot of the charm of Europe going for it, it won't cost a lot getting to it.

In fact, for the same price you'd pay just for the round-trip economy peak season airfare to London, you can have a complete two-week vacation in Canada.

So send for the brochure that answers the question, "Isn't there a place I can have a terrific summer vacation without busting my budget?"

Yes, Canada.



AIR CANADA

P.O. Box P, Staten Island, New York 10305.

Please send me your summer travel brochure describing the great time I'll have and how much of it can be charged on the American Express Card.

Name_____

Street_____

City_____

State_____ Zip_____

My travel agent is_____

SN-5

SYLVANIA
BLUE DOT
MAGICUBE
101
SYLVANIA
100W
120V
SOFT WHITE

OUR LIGHT

From home to highway

One way you know our company is through GTE Sylvania.

You probably know our Blue Dot™ flashcubes and Magicubes. (People take more pictures with them than with any other brand.)

And that Blue Dot appears on light bulbs you may use in your home.

We also make fluorescents.

Our big lamps light up streets and highways. And our small lamps glow softly on hi-fi sets.

We make fun lamps for decorating homes and stores. And energy-saving lamps for lighting factories and offices. (Our serious side.)

We make lamps that grow plants. And lamps that may help heal disease.

Altogether we make about 6000 different lamps.

So while GTE is the phone company to 23 million people-millions more know us for our light side.

SYLVANIA LIGHTING

SIDE GTE

General Telephone & Electronics, One Stamford Forum, Stamford, Conn. 06904

Secretary Ripley's comments

The view from the castle

Our annual folk festival celebrates diversity; it may well have some lessons for the international arena

Eight years ago the Smithsonian started its annual summer Festival of American Folklife involving live performers. They demonstrated to visitors on the Mall that a museum exhibit might consist of tools or instruments temporarily laid aside, but not obsolete. The persistence of crafts, of cultures that involve making, using and playing with such tools or instruments, needed to be underscored, and our theater of action was the museum.

I venture to think that there is a close relationship between what our festival (this year June 25-July 6) has been seeking to express and some of the newly recognized strivings encompassed in the terms "cultural diversity" or "pluralism." In the folk festival we rejoice in the annual recognition of the persistence of "old ways in the New World," as we call it—the perpetuation of national and family folkways, whether they belong to so-called minorities or are transmitted customs from all over the world.

In the same way, we have brought native Americans to the Mall to demonstrate the resurgent Indian population's concern with enduring crafts and rituals, while our "African Diaspora" celebrates the music, body movement and life-styles of blacks on three continents. In a typical large American city such as Philadelphia there are perhaps 30 subcultures, whose practitioners jealously perform Polish folk dances, eat Greek food or preserve tribal music.

There is in mankind today a fear of the loss of identity. We fear that union of megastates and megacorporations which for efficiency's sake would mold us all—our thoughts as well as our actions—to a new life where differences between groups would be smoothed out. Communications, education and international economics would gradually wipe out group differences.

In the United States we still recognize cultural diversity or pluralism. In the United Nations, nationalism is rampant. Nationalism is a political extension of the individual's yearning for the family, the clan, the tribe.

Is it any wonder that the persistent quest for identity surfaces in nationalist (*i.e.* tribal) strivings in India? Nagas prefer to keep themselves identifiable as Nagas. Persistent tribal patterns in Africa, religious patterns in Northern Ireland, nationalist actions in the Middle East, all have a close correlation with the persistence of folk cultures and tribal or clan relations. I suspect that the continuing tensions in the Middle East would be placed in clearer perspective if they were understood to have strong folk roots far deeper than economics or even religion. Recent experience in the less developed parts of the world shows that fear of the iron fist can only temporarily still these folk strivings. International law and order, lacking even an iron fist, has failed to control international anarchy. Perhaps there is another way through understanding and accommodating the basic human fears of loss of identity, and the basic persistence of folkways. For these are urges so strong as to confound the planners, let alone the diplomats.

In view of the harmony and delight that our folklife festivals produce, are our museum experiences perhaps telling us something that we should hearken to in a larger theater?

S. Dillon Ripley

Fly free to Hawaii (& back) for our South Seas cruises.

Special air-sea offer from the West Coast for 31-day cruises from Honolulu Nov. 6 and Dec. 15.

Whether or not you live on the West Coast, you can still take advantage of this special free air travel allowance.

When you sail with the SS MARIPOSA or SS MONTEREY on our luxurious 31-day South Seas cruise from Honolulu, we'll take $268 off the air fare from your city to Hawaii and back. (This is equal to the special round-trip offer from the West Coast.)

Or if you prefer to take our 43-day South Seas cruise round-trip from California Oct. 31 or Dec. 9, we'll deduct the same allowance ($268) from your cruise fare.

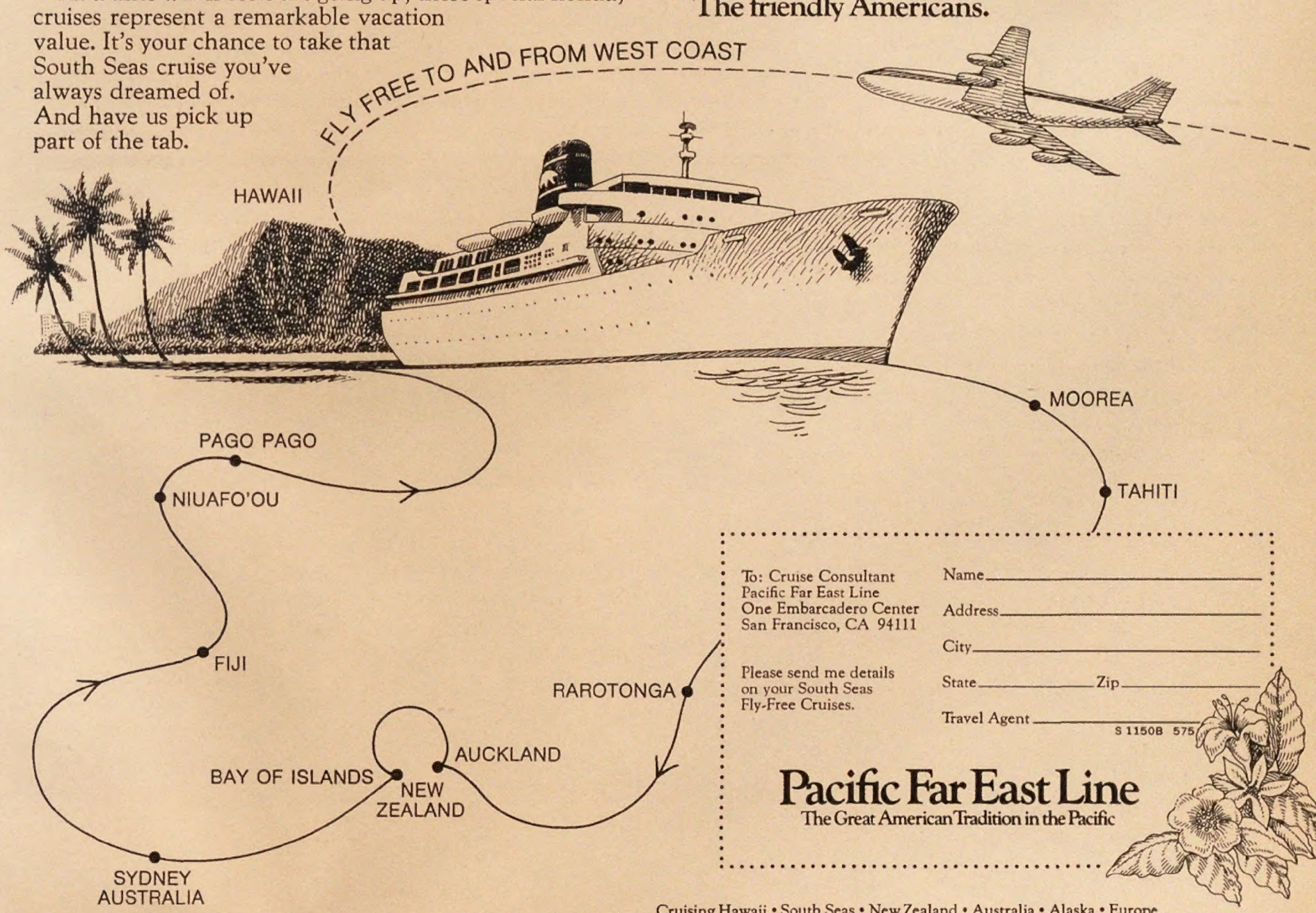
At a time when costs are going up, these special holiday cruises represent a remarkable vacation value. It's your chance to take that South Seas cruise you've always dreamed of. And have us pick up part of the tab.

While it's summertime south of the equator, you'll enjoy all the best of fabled Polynesia. All in less time than you thought possible—just 31 days.

As you cruise you'll enjoy the famous hospitality and Aloha spirit of the SS MARIPOSA or SS MONTEREY. Registered in the United States, these proud ships are renowned for the kind of cuisine, service, accommodations and entertainment Americans love best.

Call your travel agent or send us the coupon for full information on this extra-special opportunity to cruise the South Seas.

SS MARIPOSA SS MONTEREY
The friendly Americans.



To: Cruise Consultant
Pacific Far East Line
One Embarcadero Center
San Francisco, CA 94111

Please send me details on your South Seas Fly-Free Cruises.

Name_____
Address_____
City_____
State_____ Zip_____
Travel Agent_____

S 1150B 575

Pacific Far East Line
The Great American Tradition in the Pacific

Cruising Hawaii • South Seas • New Zealand • Australia • Alaska • Europe

WINE TALK

by Austin, Nichols

M. de Rausan thought so highly of this wine that he dumped it in the Thames.

Rather than sell his claret to London merchants at a price he considered unworthy, one 18th-century proprietor of Château Rausan began throwing it overboard, cask by precious cask. Finally, with four barrels bobbing in the river, the wine merchants relented.

Today, we at Austin, Nichols find that M. de Rausan's pride was fully justified. For the wine from his vineyard—now known as Château Rausan-Segla—is one of the great red wines in the world. Among the wines of Margaux—famous for their bouquet—it is regarded as exceptionally full and fragrant.

Of Rausan, the wine expert Benjamin Franklin once said, "This wine I import for myself." And of Rausan-Segla, the experts at Austin, Nichols say, "This wine we import for you."

Letters to the Editor

Salt marshes

Dear Sir: I was especially pleased to see the marsh country of the South Atlantic coast given full feature treatment in your March issue. A few Georgia and Carolina groups have recently formed an organization patterned, in fact, after the Natural Resources Council of America, of which I am a former chairman. We hope to arouse the public to the need for vigilance against reckless "development" of the remaining important marshes.

There appears to be a growing tendency on the part of some technologists to stress the pollution-abatement capabilities of fresh as well as salt marshes. Care should be taken to prevent arousing a belief on the part of the public that all we need do with polluted water is dump it in the nearest marshy area.

William Voigt jr.
Blackshear, Georgia

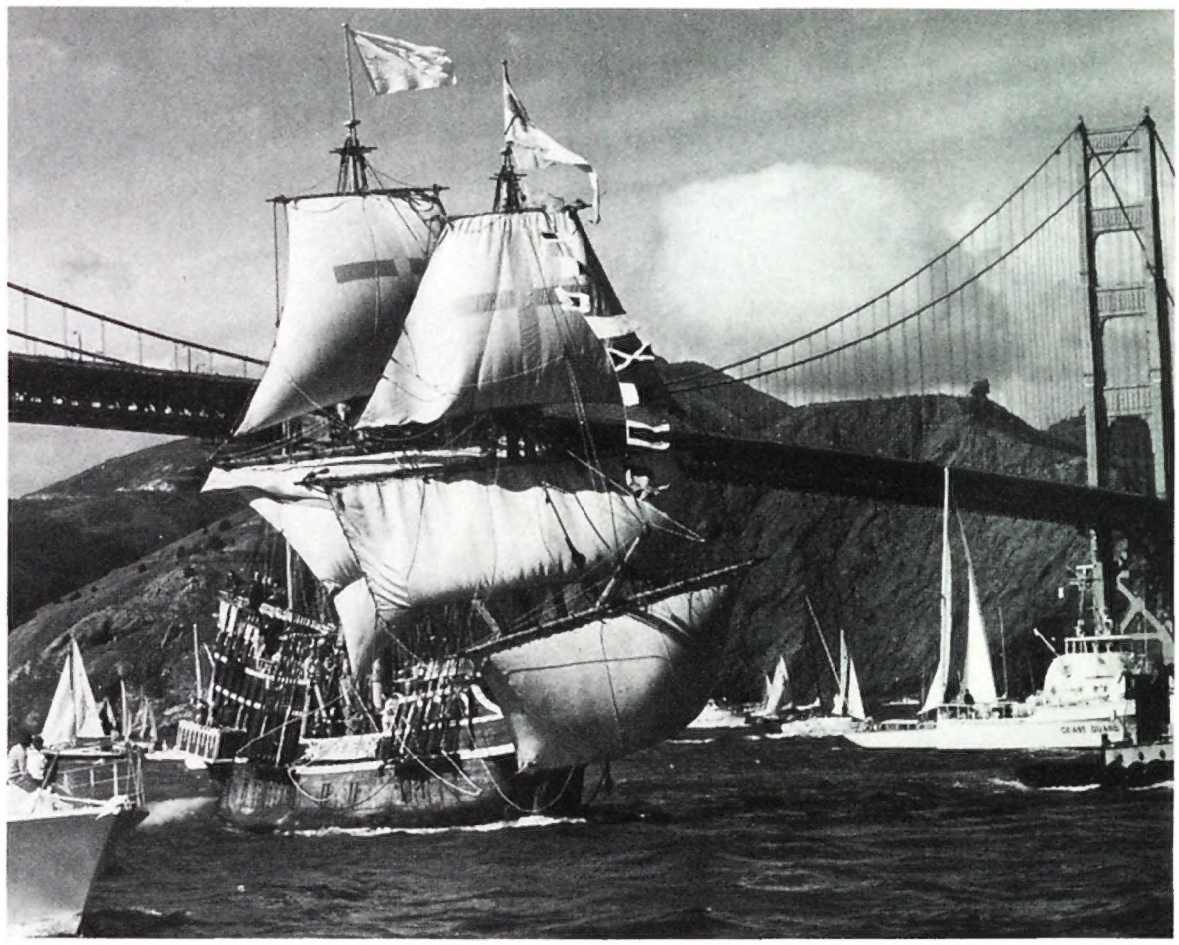
Golden Hinde

Dear Sir: A thrilling sequel to your article in July on the replica of Sir Francis Drake's *Golden Hinde* took place recently in San Francisco. A quarter of a million people jammed the shoreline to watch the *Golden Hinde II* sail triumphantly under the Golden Gate Bridge (below), completing a five-and-a-half-month voyage from Plymouth, England. She will now become a museum, open to the public.

Richard Lee
San Francisco, California

Coyotes

Dear Sir: Laurence Pringle's article on sheep and coyotes is fair, objective and interesting. We sheep people suffer the monetary losses caused by predation and think that the product of our labor is a valuable and essential contribution to the economic system. Should it come to a



Replica of Drake's *Golden Hinde* sails through Golden Gate.

Interstate Long Distance rates have just changed.

Although most rates have increased, if you know your dial-direct discounts, you can have more control over your Long Distance costs.

Now...take advantage of our new one-minute dial-direct specials.

22¢ or less for night and weekend callers.

(Additional minutes only 16¢ each, or less.)

Dial direct coast-to-coast from your home or office any night after 11 p.m. and any time weekends except Sunday evening (5-11 p.m.). The first minute is 22¢, each additional minute only 16¢. Lower rates apply on shorter distances.

36¢ or less for evening callers.

(Additional minutes only 26¢ each, or less.)

Dial direct coast-to-coast from your home or office any evening Sunday thru Friday, between 5 and 11 p.m. The first minute is 36¢, each additional minute only 26¢. Lower rates apply on shorter distances.

56¢ or less for daytime callers.

(Additional minutes only 40¢ each, or less.)

Dial direct coast-to-coast from your home or office any weekday, Monday thru Friday, 8 a.m. to 5 p.m. The first minute is 56¢, each additional minute only 40¢. Lower rates apply on shorter distances.

NEW RATES FOR COAST-TO-COAST INTERSTATE CALLS

DIAL-AND-SAVE ONE MINUTE RATES

FULL RATE	35% DISCOUNT	60% DISCOUNT
WEEKDAYS	**EVENINGS**	**NIGHTS & WEEKENDS**
Monday-Friday 8 a.m.-5 p.m.	Sunday-Friday 5 p.m.-11 p.m.	Every night 11 p.m.-8 a.m. Saturday—day and night Sunday—day and night except 5 p.m. to 11 p.m.
First Minute **56¢**	First Minute **36¢**	First Minute **22¢**

Additional minutes cost less than the first minute.

Dial-direct rates apply on all interstate calls (excluding Alaska) completed from a residence or business phone without operator assistance. They also apply on calls placed with an operator from a residence or business phone where dial-direct facilities are not available. For dial-direct rates to Hawaii, check your operator. Dial-direct rates do not apply to person-to-person, coin, hotel-guest, credit card or collect calls, or to calls charged to another number, because an operator must assist on such calls. Rates quoted do not include tax.

OPERATOR-ASSISTED THREE MINUTE RATES

STATION-TO-STATION
Full rates apply at all times
First 3 minutes
$1.95

PERSON-TO-PERSON
Full rates apply at all times
First 3 minutes
$3.55

Additional minutes same as dial rate. Applicable discounts apply to additional minutes during "Evening" and "Night & Weekend" periods.

Cut this chart out and put it in your phone book.

goodness knows

The Artists of CYBIS capture in porcelain the never-be-defeated response to life that only goodness knows.
Her name: POLLYANNA.
Touch her.
And, goodness knows, she touches you.
From the CYBIS Children to Cherish Collection.

CYBIS®
Porcelain Enchantments

© CYBIS 1975. *Pollyanna.*

The CYBIS Newsletter, "The Phoenix," available for one dollar. Complimentary brochure included. CYBIS Porcelains, SP, 65 Norman Avenue, Trenton, New Jersey 08618.

For your invitation to a special Cybis exhibit featuring the American Buffaloes and other Presidential Gifts of State from Cybis, Sunday afternoon, June 8th, write Brielle China & Galleries, Highway 71, Brielle, N.J. 08730 . . . or tel: (201) 528-8400.

choice between the welfare of predators and sheep raising, the decision must be in favor of the livestock.
Samuel S. Maclay
Florence, Montana

Dear Sir: "Defenders of Wildlife" and, I suspect, the vast majority of the public supports this view of the Council on Environmental Quality: "Public lands are lands held in trust for all Americans, not just one or another special interest group." However, at this time, the Department of Interior allows emergency use of predator poison under the same circumstances on both public and private land. We believe that this is a travesty approaching a "rape of the commons."

While the use of inhumane and illegal predator-control techniques on public land is both tragic and inexcusable, the issue is secondary. The main issues are: Who owns and controls public land?
John W. Grandy IV
Defenders of Wildlife
Washington, D.C.

Dear Sir: As a sheep raiser, I believe that the answer to the coyote problem lies not so much in predator control as it does in providing adequate protection for our flocks. The best way to do this is to have a good tough sheep dog that will fight to the death, if necessary, to protect the flock. I am training a Great Pyrenees for the job.
John M. Seeborg
Longview, Washington

'Our Elephant'

Dear Sir: It was good to read in the March issue Thomas Dozier's article on how the Smithsonian acquired 'our elephant,' but I was disappointed not to get data on his tusks. Judging by your photograph, they seem to be in good condition and of unusual size.
Theodore Steinway
Steinway & Sons
Long Island City, New York
The tusks of this elephant are not particularly extraordinary. The dimensions are: Left tusk on the outside curve measures 6 feet, 6½ inches, the base circumference is 20 inches, and it weighs 92½ pounds. The right tusk, on the inside curve measures 6 feet, 11½ inches, has a circumference of 20 inches, and weighs 93 pounds. Ed.

©1975 New England Mutual Life Insurance Company, Boston. Subsidiary: NEL Equity Services Corporation, mutual funds; Affiliate: Loomis, Sayles & Company, Inc., investment counselors.

"My insurance company? New England Life, of course. Why?"

Our crew also offers mutual funds, variable annuities and investment counseling.

Lifetime Partnership
CROSS®
SINCE 1846
Ladies' And Gentlemen's Writing Instruments From Six Dollars.
Mechanically Guaranteed For A Lifetime. At Better Stores Worldwide.

Dear Sir: Hunting may very well *not* be "fast approaching its twilight," as Thomas Dozier writes. It is holding its own in this country and is flourishing elsewhere. It has a certain useful role as an outlet for an increasingly urbanized, turned-off society. I suspect that hunting will grow considerably by 2000, rather than shrink as Dozier feels is inevitable.
Bill Davidson
National Rifle Association of America
Washington, D.C.

Dear Sir: For the millions of Americans who believe that hunting has no place in modern society, the Smithsonian's elephant will henceforth be a symbol of man's greed and lack of concern for his fellow creatures. The "If it's the best of the species, kill it and stuff it" attitude doesn't deserve to be memorialized in the nation's museum.
Karl Nordling
The Humane Society of the United States
Washington, D.C.

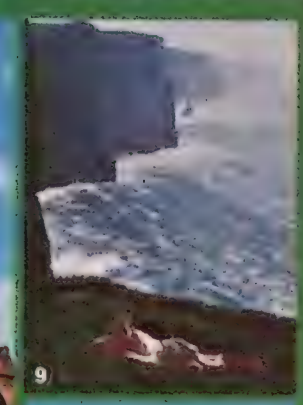
Dear Sir: When I visit your Mall and observe the large elephant, a lump will come in my throat and I will picture him in all his majesty in his native habitat where he should have been allowed to live out his life in peace.
Jessie L. Thompson
Bandera, Texas
When the historic Smithsonian elephant was killed, present restrictions on hunting were not in effect. The Institution had nothing to do with his death and it seems fitting that he be immortalized. How else can one mount an educational display without the animals in question being dead? Ed.

UNESCO

Dear Sir: I am disturbed by Secretary Ripley's statements in "The view from the castle" regarding the UNESCO resolution to bar Israel from the European region, cutting off her modest budget. I know of no Islamic settlements destroyed by Jewish archaeologists. On the contrary, Israeli excavations in Jerusalem have revealed large palaces south of the Temple Mount that were constructed by Omayyad caliphs.

Mr. Ripley further states: "Religious extremism, whether from Arab or Jew, as expressed in the destruction of cemeteries or houses, apparently still persists." It is

Experience IRELAND



1 Historic Rock of Cashel, *County Tipperary.* / **2** Georgian revels in Tailor's Hall, *Dublin.* / **3** The clash of ash at the All-Ireland Hurling finals. **4** Dublin and the River Liffey at night. / **5** Fishing time on Lough Corrib, *Galway.* **6** Back-packing through the Dublin Mountains. / **7** Round tower at 7th century Clonmacnois, *County Offaly.* / **8** Stately Westport House, *County Mayo.* **9** The 700-foot Cliffs of Moher, *County Clare.* / **10** Cruising on the River Shannon. / **11** Golfing at Killarney, *County Kerry.* **12** Spring tulips at Ashford Castle, *County Mayo.*

Europe's corner of enchantment

Visitors are special people in our enchanted island. Our majestic scenery, the pervasive magic of our history and ancient culture, the genuine warmth of our people will make you feel at home abroad. And our prices will do something special for you too.

Bed and breakfast in a charming farmhouse — $4. An evening at the famed Abbey Theatre — $1.25. Stay in a luxurious modern hotel, or a mediaeval castle. Go golfing on any of our 240 courses. Sing in our pubs, where a pint of stout is 55 cents. We have the lowest air fares to any country in Europe. Find out more about us by clipping this coupon.

U-1

Irish Tourist Board
Box 1200, Long Island City
New York, 11101

Aer Lingus
Irish Airlines
(212) 757-9200

Yes, I want to experience Ireland. Please send me your free, full-color, 32-page booklet, "Ireland Personally Yours."

Name _____

Address _____

City _____ State _____ Zip _____

My travel agent is _____

Bonaparte au Mont St.-Bernard. Peinture par Jacques-Louis David. (Musée de Versailles)

Like Hannibal and Charlemagne before him, Napoleon boldly crossed the Alps into Italy by the Great Saint Bernard Pass on May 15, 1800. An army of 40,000 men, with field artillery and baggage trains, completed the exhausting journey five days later, and went on to win the battle of Marengo on June 14th.

COURVOISIER
COGNAC

IMPORTED BY W.A. TAYLOR & COMPANY, NEW YORK, N.Y. 80 PROOF. SOLE DISTRIBUTORS FOR THE U.S.A.

The Brandy of Napoleon

Arab extremism, not Jewish. It is Israeli policy not to destroy any structures in Jerusalem that have religious, cultural or historical value. When the Jewish quarter of Jerusalem was occupied territory under Jordanian domination, the Jordanians tore down every building in the quarter, including several world-famous medieval synagogues, and desecrated the ancient Mount of Olives cemetery.

Benjamin Adelman
Silver Spring, Maryland

René Maheu, former Director-General of UNESCO, in an article in Le Monde, *November 21, 1974, had a note of criticism for Israeli reconstruction—the "erratic modern town-planning." He found the clearance of the area in front of the Wailing Wall and the building of an esplanade on it a regrettable alteration of the site's cultural character. The main thrust of Secretary Ripley's article was to deplore the insertion of international politics into the generally valuable work of UNESCO.* Ed.

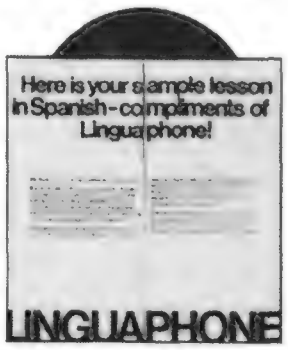
Dear Sir: As early as November 1968, UNESCO's General Conference made an urgent appeal to Israel to cease archaeological excavations and alterations of the cultural and historical sites in Jerusalem. Similar appeals were made in 1969, in 1971, twice in 1972. Therefore, the resolutions of last November were not made suddenly "for purposes of Third World politics," but were the result of six years of effort to resolve the problem.

Hendrine Kleinjan
Alameda, California

Highly qualified experts have been dispatched to Jerusalem to report on the excavation situation, the latest being Raymond Lemaire, professor of architecture at the University of Louvain and Secretary-General of the International Council of Monuments and Cities. In the spring of 1974, he reported that "the excavations are being carried out by a . . . well qualified team of experts of various kinds, who are attentive to all aspects and to all the periods of which remains have been found on the site." Among those who found the November resolutions "political", however, are Nobel Laureate René Cassin, former Director-General Maheu, Nobel Laureate Julius Axelrod, Harvard economist Kenneth Arrow and Mme. Françoise Giroud, France's Secretary of State for Women's

Who says you can't speak another language in 60 days?

With Linguaphone, you can speak a new language—fluently and idiomatically—in as little as 60 days. It's an easy, interesting, natural method—used by leading schools and universities world-wide. You listen to and imitate flawless native speakers. No old-fashioned verb drills! Over 4,000,000 successful students. Record and cassette courses in more than 20 languages.



Free Sample Lesson!

Mail coupon today for sample lesson in French or Spanish. (The Linguaphone method is the same for *all* languages.) See how quickly, easily, you can learn a new language with Linguaphone!

Linguaphone Institute, Inc.
Dept. SMP51,100 Park Avenue
New York, N.Y. 10017

I want to learn a new language in my own home. Rush FREE sample lesson indicated, plus an illustrated folder that gives a complete explanation. I understand I will be under no obligation.

Send sample lesson in: ☐ French ☐ Spanish
☐ Mr.
☐ Mrs. _____
☐ Ms.
Address _____
City _____
State _____ Zip _____
I am most interested in
☐ French ☐ Spanish ☐ Italian ☐ German ☐ Hebrew
☐ Other _____

Linguaphone for Languages A Service of Westinghouse Learning Corporation

Sabena's fly-drive programs.

Start your tour in beautiful Belgium, gateway to all of Europe.

Brussels is just a few hours drive from the other great capitals of Europe. So go where your fancy dictates. Unlimited mileage for as little as $500, including round trip air fare. Other Sabena Holiday Abroad tours take you to the Middle East, Africa, Eastern Europe.

For information, see your travel agent or write Sabena Belgian World Airlines FM5, 125 Community Drive, Great Neck, N.Y. 11021.

HOLIDAY ABROAD SABENA

Truck drivers have always known what motorists need to know about aluminum.

That aluminum can take it. That it can be engineered to perform as well as the material it replaces. Yet, because it's a weight-saver, aluminum gives you a lighter vehicle that saves gas, brake wear, tire wear, even registration costs in some states.

Aluminum has performed so well in trucks, which are built to last hundreds of thousands of miles, that automotive engineers are now evaluating additional aluminum applications for the automobile—specifically, hoods, wheels, trunk decks, bumpers and bumper reinforcements . . . even, in some cases, aluminum doors. They understand better than most of us that American cars must become less expensive to operate, without sacrificing strength. So, they're specifying strong, lightweight aluminum alloys specially designed for passenger cars.

Sturdy aluminum components that save weight in trucks.

The men who drive truck rigs equipped with aluminum cabs, frame rails, radiator parts, bumpers, fuel tanks, suspension parts and forged disc wheels know how well aluminum stands up over the long haul. Under rough treatment. In all kinds of weather. They also know that lightweight aluminum components pay off financially. Because a lighter rig can carry more payload, yet requires less fuel when rolling. Either loaded or empty.

If you'd like a more in-depth look at how aluminum in automobiles helps in the conservation of energy, send for our brochure, *Energy, Aluminum and the Automobile.* Write to Aluminum Company of America, 985-E Alcoa Building, Pittsburgh, PA 15219.

The reasons for using aluminum are found in aluminum itself.

ALCOA

Affairs, as did many observers and the press representing Western countries. Ed.

Dear Sir: This summer, with considerable pleasure, I agreed to accept membership from UNESCO in the International Advisory Committee for Venice and had looked forward to a long and fruitful association with this worthy cause.

In view of the action taken at the General Conference of UNESCO in November, which seems to me to confirm an open and blatant anti-Israel bias, I have tendered my resignation.

The viewpoint I am most sympathetic to and which seems to express my own feeling is the statement made by Secretary Ripley.

Roger W. Straus jr.
New York City

S.S. Great Britain

Dear Sir: In Alfred Friendly's article, "An ocean relic is given new life," the group of Americans said to have spent $100,000 on preliminary studies for restoration was actually one individual—William A. Swigert, then president of Pacific Bridge Company. He relinquished his interest in salvaging the *Great Britain* after a visit to England and played a major role in the relocation of the venerable maritime relic and in Britain's acquisition of her.

Bart Benedict
Mill Valley, California

When political sin had style

Dear Sir: Alexander B. Callow's nostalgic article on political bosses reminded me of that consummate Chicago ward captain, Hinky Dink Kenna, to whom is attributed this classic phrase: "If you don't go to other people's wakes, they won't come to yours."

Robert J. Doran
Danbury, Connecticut

Picture Credits

Cover George Silk; 8 Tom Vano, Golden Hinde Co.; 26 Suzanne Anderson; 29 Charles Phillips; 34-41 George Silk; 42 Jehangir Gazdar; 43 N. C. News Service; 44-49 Jehangir Gazdar; 50-57 Yale Joel; 60-67 John Huehnergarth; 68-73 Peter Stackpole 74-81 Nina Leen; 83 Yoichi Okamoto; 85 Walter Hortens; 86-87 Yoichi Okamoto; 90-92 National Archives; 94 left Smithsonian Institution, National Archives; 95-98 top National Archives; 98 Smithsonian Institution; 100 © 1975 by Yigael Yadin, reprinted by permission of Random House, Inc.; 116 Brenda Tilley.

If you don't want a $200 Rolls, maybe you'd like a $100 Fiat.

Incredibly authentic car model kits by Pocher d'Italia reproduce these (and two other) classics in exact 1/8 scale. Completed, they range from 18-1/2" to 26-1/2" long. You build your car with nuts, bolts and screws. No painting. No special tools needed. Each model has working components. (In the Fiat, the suspension, steering system, braking and chain drive work.) Hundreds of separate parts in brass, stainless steel, copper, rubber, high-impact plastic. See them all in our free full-color brochure. Then choose yours.

Deluxe Classics, Dept. SM7
5900 Wilshire Boulevard, Suite 2760
Los Angeles, California 90036

Please send me your free full-color brochure

Name:
Address:
City:
State/Zip:

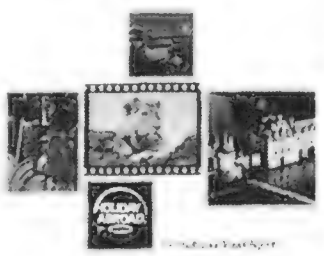
Sabena's Holiday Abroad® catalog.

Europe.
East Europe.
North Africa.
Middle East.
Africa.

Sabena Belgian World Airlines HM5,
125 Community Drive, Great Neck, N.Y. 11021.

Name
Address
City State Zip
Telephone
My travel agent
Location

Sabena's 1975 "Holiday Abroad"



Here is a full range of tours from popular priced to prestigious, conducted by specially selected tour operators

The Holiday Abroad catalog introduces you to Europe, Africa and Asia in 104 pages of travel adventures

And when you fly Sabena's scheduled jets to or from Brussels, you get Belgium's Bonus Days worth $260 in free treats

HOLIDAY ABROAD SABENA

CINEMA
FREE ADMISSION
TO ONE OF THE MOST CAPTIVATING BOOKS EVER WRITTEN ABOUT THE MOVIES!
Read this extraordinary volume FREE for 10 days as a guest of Newsweek Books
...and discover the brash beginnings of this fledgling art...venture behind the scenes and onto the sets as the great stars perform and classic moments are recorded ...trace the turbulent legacy of Hollywood and her most famous artists—from Barrymore to Hepburn to Brando.
CINEMA
is your introduction to a fascinating series of the creative arts...
World of Culture

The most popular and influential art form of the twentieth century . . . now the complete story of its incredible growth and development, the special meaning and great moments of

CINEMA

It's the tale of brilliant pioneers like Griffith and Chaplin and Mack Sennett shaping film tradition straight from the "magic lantern days." Of Errol Flynn and Mae West adding their special brio and panache. It's Alfred Hitchcock magnificently scaring us to death . . . and John Wayne making himself a legend. It's song-and-dance and high noon showdowns . . . Mickey Mouse and Greta Garbo . . . *Birth of a Nation* and *2001.*

It is, in fact, a world that has touched all of us with its soaring fantasy and biting truth, its high drama and low comedy.

Now you can enjoy one of today's most colorful and intimate accounts of this enduring phenomenon—*for you are cordially invited to read CINEMA for 10 days at absolutely no obligation or cost.* To see for yourself its memorable highlights in more than 150 illustrations, photos and period posters. To trace its development through more than half a century of rapid change. And to share in the fascinating reminiscences of some of cinema's most famous and infamous personalities.

Find Out Why

You'll find out . . . why Hollywood, in 1910, was literally a town of outlaws . . . whose film debut, in 1932, sparked such a storm that the Legion of Decency was created . . . who was Hollywood's first "superstar" actress . . . and why studio executives rejected an aspiring young actor named Clark Gable in his first screen test.

A Series Called WORLD OF CULTURE

CINEMA is your introduction to an exceptional new series called *World of Culture* . . . Newsweek Books' dynamic new collection of the creative arts. Each 192-page volume in the series—which includes such books as MUSIC, THEATER, PAINTING (two volumes), DANCE, THE NOVEL and others—features *a valuable narrative-history* of each art form; *scores of illustrations* many in full color; *a special section of literary excerpts* by or about noteworthy figures in the field; and *a full index* and *reference section.*

Every Volume FREE for 10 Days

For you and your entire family, these collector-volumes offer an uncommon and entertaining perspective into a world of the arts—books to pick and choose according to your own tastes and always on the same 10-day, free-examination basis. *All without ever obligating yourself in any way.* The price: each volume is just $7.95 plus a modest charge for postage and handling. (See the attached order card or coupon for details of a trial subscription.)

Deluxe Edition Available

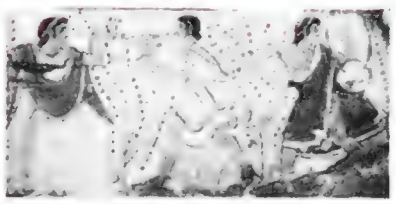
Each volume in the *World of Culture* series—including CINEMA—also comes in an exquisite Deluxe Edition, with gold-tooled binding in a fine-grain substance designed to outlast ordinary leather. This gives your book the custom look of volumes costing much more—yet you pay only $2 extra per book. Check appropriate box on the coupon or order card.

Charlie Chaplin (18" x 24")

FREE MOVIE POSTER

For simply agreeing to examine CINEMA for 10 days, we'll send you this classic movie poster! And, as an extra bonus, you'll also receive two full-color artists' prints (shown below). All three are yours to keep —no matter what your decision about the book!

plus 2 BONUS PRINTS



Etruscan Musicians (30" x 14½")

Hamlet (12" x 30")

Newsweek Books/World of Culture CKX 35
The Newsweek Bldg., Box 417, Livingston, N.J. 07039

☐ Please send me CINEMA to examine FREE for 10 days and enter my trial subscription to *World of Culture.* If I wish, I may return the book within 10 days and owe nothing. Otherwise, I will remit $7.95 plus postage and handling. You may then send me future volumes in the series one every other month, on the same trial basis and at the same price. I may cancel my subscription at any time simply by notifying you.

☐ Please send this and any future volumes in the Deluxe Edition at $2 more per book.

Include my FREE GIFT POSTERS!

Mr.
Mrs.
Miss (please print)

Address

City

My initials

State Zip

Note: Available only in U.S. and Canada.
Residents of Canada: Add $1.00 more per volume.

THE BEST CALCULATOR YET

At a Price You Can Afford

LITRONIX'S Newest Model - The 2230

Full 4-Key Memory □ Square Root □ Percentage Key □ Adds □ Sub. □ Mul. Div. □ Sign Changer □ Exchange Key □ Flashing Error Indicator □ Algerbric Logic □ Floating Decimal □ Automatic Power Off □ Chain - constant & mixed Calculations □ Batteries included □ AC Adapter $4.50, optional □ & whether you drop it, or a steam roller roles over it . . .we unconditionally guarantee it no matter what happens to it for a year! A most sophisticated calculator at an unbelievable low price!

$32.50

Price includes shipping & handling

Send check, money order, or your Bank Americard No. _____
Mastercharge No. _____
to:
Calculator Wholesale Division
4500 Campus Drive, Dept. No. 348
Newport Beach, California 92660
(714) 640-8292
Calif. residents include 6% Sales Tax

There's Nothing Like It!

Wonderful Sight Light

No Glare . . . No Squint . . .

Contemporary Model
Traditional Model
Specially designed optical system uses standard bulb
Up to 5 times the light of conventional lamps . . . yet completely glareless!

✶ READING SMALLEST PRINT
✶ SEWING BLACK ON BLACK
✶ FULLY ADJUSTABLE

Satin brass combined with base and shade in Black, White or Avocado
Traditional $72.50
Contemporary $58.50
Overall Satin Brass (Contemp. only) $78.00

Buy America's Favorite Reading Lamp
Shipment Postpaid • Check or M.O.

LIGHT-CRAFTERS
Dept. N5
Ten Lexington Avenue
Greenwich, Conn. 06830

We sell only by mail . . .
write for nearest Sight Light stores.

Where's Peter?

In the British Virgin Islands—a spectacular coral barrier, under acres of blue sky, sheltering the warm Caribbean from the cold Atlantic.

Here lies Peter Island. And the Peter Island Yacht Club. An intimate cottage-colony hotel offering splendid isolation.

Play tennis under shady palms, ride horseback on deserted beaches, dive magnificent virgin reefs, or navigate the Sir Francis Drake Channel.

Do everything. Or do nothing at all.

Peter is waiting for you.

Peter Island

Peter Island Yacht Club, British Virgin Islands

Low summer rates and special package plans now in effect.
Call Loews Reservations, Inc. (LRI), toll-free throughout the United States, and ask for Peter. They'll give you rates, new color brochure, and immediate, confirmed reservations.

Phenomena, comment and notes

The reluctant inventors, good news and bad in the energy business, and the tornado connection for cars

A long time ago the novelist E.M. Forster perceived in human affairs what ecologists have been trying to articulate and prove in all of nature ever since. "Only connect!" wrote Forster, and if you don't accept his injunction, then you may ignore this report on the newest form of automotive pollution. It is called vorticity pollution.

It seems that the incidence of tornadoes has increased sixfold in the United States in the last 40 years, and this coincides with the increase in vehicular traffic, according to four scientists writing in *Nature* (Volume 253, Number 5489).

Coincidence, you might well say, is different from cause and effect, but the four scientists point out that streams of opposing traffic whooshing past each other on the right-hand side of the road create "cyclonic vorticity" between the streams. That is, counterclockwise vortices of air—lots of them. "Vorticity," they write, "is a unique requirement for the formation of tornadoes and hurricanes, and motor vehicles are the only man-made source of nonrandom vorticity we know." In other words, a great deal of motor traffic may perturb the natural vorticity of the atmosphere enough to worsen the tornado situation.

To back up their insight, the scientists adduce several further observations. Their theory predicts mathematically that the center of tornado intensity would have moved eastward as traffic increased: It has. It predicts that counterclockwise tornadoes (always more prevalent) would

Only one electric portable typewriter has a snap-in cartridge ribbon.

And right now your Smith-Corona dealer can offer a snap-up price.

Smith-Corona® has advanced typewriters into The Cartridge Age. We have the only electric portables with a snap-in, snap-out cartridge ribbon system.

Snap! You can replace a worn ribbon with a fresh ribbon in just 3 seconds. Or a black ribbon with any of five color ribbons.

Snap! In 3 seconds you can replace an ordinary fabric ribbon with a carbon film ribbon that makes typewriting look like printing.

You can even snap in a correction ribbon that allows you to correct errors...in 3 seconds.

Right now, we're offering our dealers this unique Smith-Corona Cartridge Ribbon Typewriter at a special low price. So if you've been thinking about a new typewriter, now is the time to snap one up.

SCM® SMITH-CORONA
SCM CORPORATION

The Typewriter of The Cartridge Age.

In Kashmir, a charming houseboat with three meals a day plus personal staff

$10 a day per person.

In Jaipur or Madras, hand-crafted gold earrings studded with rubies

$50

From Delhi to the Taj Mahal by chauffeured car–126 miles

$45 for 3 persons.

Yes, things are still *that* inexpensive in India. You can still get fantastic buys: rugs, jewels, silks, carvings. You can still stay at fine air-conditioned hotels or palaces, dine in the best restaurants, travel about in comfort for at least 30% less than in other countries.
And for what you spend no conceivable vacation can pay you back the way India can. It's "the greatest show on earth". With the longest run, we might add. To top it all the fare for this trip that can forever change the way you see life is only $725 round-trip from New York. See your Travel Agent or clip the coupon.

India '75 South Asia Tourism Year

Please rush me your free India brochures.

Government of India
Tourist Office Dept. 206-2114
New York, North Mezzanine
30 Rockefeller Plaza, 10020
Chicago, 201 N. Michigan Ave., 60601
San Francisco, 685 Market St., 94105
Toronto, Royal Trust Tower,
Dominion Center, Canada.

Name_____
Address_____
City_____ State_____ Zip_____
My Travel Agent is_____

have increased greatly at the expense of clockwise tornadoes: They have. It also predicts that there would be fewer tornadoes on weekends when traffic is inclined to be less: That too is the case.

Now intuition might tell you that this is all suppositious, but it could be true. It could also be nothing more than the most elaborate defense yet devised for the peculiar British habit of driving on the left-hand side of the road. As the four scientists say, "If the obvious turnabout were made, there might well be an immediate . . . decrease in tornadoes."

After you, Alphonse

Two unlikely antagonists are locked in battle over who gets to be last in making a technological breakthrough. The opponents, according to *Science & Government Report* (Volume 5, Number 5), are the tobacco and furniture industries. The Consumer Product Safety Commission thought it would be a good idea if furniture makers would produce nonflammable fabrics so that chairs and sofas and people on them would not get burned by cigarettes. The furniture manufacturers countered with the suggestion that cigarette makers produce a self-extinguishing cigarette. The Commission replied that it doesn't have jurisdiction over cigarettes, so get on with the nonflammable fabrics. The whole business has now gone to the courts.

Energy update

The literature is virtually bloated with reports on energy technology and economics and, sorry to say, the bad news dominates the good. Consider the Alaska oil situation. The *Wall Street Journal* has reported that investors are getting nervous about the pipeline under construction (see SMITHSONIAN, October 1974). It could be as much as a year late in completion and its costs are skyrocketing: Last year the cost was estimated at $4 billion; now its $6 billion. Meanwhile, the Canadian pipeline, proposed as a supplement to the Alaska pipeline, looks a bit iffy: According to *New Scientist* (volume 65, number 938), two Canadian earth scientists have found that it would run dangerously close (100 miles) to an area which, in six weeks, experienced 27 earthquakes, including one of magnitude 4.8. (That, however, is good news if you

There are times when only the very best will do.

A birthday.
Happy homecoming.
Welcome to fatherhood.
The Holiday season.
Bon voyage.
Welcome to the neighborhood.
Thank you.
Father's Day.
An anniversary.

...these are just some of the times you instinctively feel the gift should be equal in every way to the thought. You wish the best; you give the best.

What is best?

We'd like to give you an easy answer. We'd like to say that Maker's Mark is the finest whisky to come out of Kentucky.

But Bill Samuels, our president, won't let us say it.

He says there's no such thing as a universal "best" in whisky — that it's always a matter of personal taste.

We do know this, Bill set out to make the very best whisky he knew how — and as a fourth generation Kentucky distiller, he knew how.

And in his own eyes, he succeeded. In other words, he believes Maker's Mark is the best Kentucky whisky to be had at any price. And we can say that there's a large and steadily growing number of people who agree with him.

There is no way our little distillery can put up enough Maker's Mark to go around everywhere. So you may not be able to find it the first place you try — but that's another reason why those who receive a bottle will value it all the more.

Made from an original old style sour mash recipe by Bill Samuels, fourth generation Kentucky Distiller.

Maker's Mark Distillery, Loretto, Ky., Ninety Proof – Fully Matured.

Just for giving?

So far, we haven't touched on those times when you yourself might feel especially deserving. All we can say is this: Try a bottle of Maker's Mark. There's a good chance you will consider it the best you've ever tasted. And if so, you'll be all set for those times when only the very best will do.

Free booklet.

When you're in our neck of the woods, we cordially invite you to visit our little distillery on Star Hill Farm near Loretto. Meanwhile, if you have an interest in the history of whisky-making in the Bluegrass state, write for a free copy of our little booklet, "The Wonderful World of Kentucky Whisky."

EAST AFRICA FIELD TRIPS

Auspices of the Sierra Club

Leisurely field trips under informative leadership. Three-week tours by car. Longer, more extensive tours by private plane.

YOU'LL LIVE IN THE WILDERNESS right among the animals . . . elephants, hippos, rhinos. The hoofed beasts: zebra, giraffe, impala, wildebeeste, buffalo and others. The predators: lion, leopard, cheetah plus smaller hunters. More birds than you ever imagined.

YOU'LL SEE the whole magnificent land from the snows of Mt. Kenya and Kilimanjaro to the beaches of the Indian Ocean . . . tribesmen as natural and exotic as the wildlife . . . white settlers . . . Asians in turbans or saris . . . veiled Moslem women . . . the ethnic struggle . . . tribalism vs. nationalism . . . agriculture vs. conservation . . . progress vs. prehistoric folkways.

YOU'LL BE COMFORTABLE. Room and bath at delightful lodges–uncrowded cars–everyone has body room and a window seat–new luxurious five passenger 2-engine planes–leisurely pace–frequently two nights in the same place.

For brochure, see your travel agent or write to:

Sierra Club (212) 354-1480
East Africa Field Trips
c/o Club Tours, Inc.
Dept. S-5, 25 West 43 St., N.Y., N.Y. 10036
Please send your East Africa brochure to

Name_____
Address_____
City_____ State_____ Zip_____
I am interested in departures in (month)

Tours are organized and operated by Club Tours, Inc.

A BIOGRAPHY of H. P. BLAVATSKY

When Daylight Comes

HOWARD MURPHET

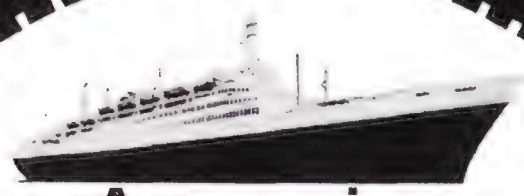
■ HELENA PETROVNA BLAVATSKY (1831-1891), well born Russian, was a formidable intellectual, scholar, linguist, iconoclast, and forerunner of todays' liberated woman. Her major works, *Isis Unveiled* (1877) and *The Secret Doctrine* (1888), have been continuously in print, and are today. Brilliant, independent thinker, prodigious writer, H. P. B., writes Joy Mills, was "the Sphinx of the 19th century [who must] be accorded a unique place in the history of ideas that have influenced modern thought." *Illustrated.*
Cloth $8.95 Paperbound $3.50

Quest Books . . . at bookstores

or postpaid, promptly, from Quest Books Dept. SS, 306 West Geneva Road, Wheaton, Illinois 60187.

The Theosophical Publishing House
WHEATON, IL LONDON MADRAS

It gets better every time around.



Announcing our 17th World Cruise

Jan. 20, 1976 from New York. From Miami Jan. 22.

87 days, 24 ports, the s.s. Rotterdam.

All the comfort and luxury of a grand ship built to sail the world, plus a fascinating new itinerary including the Mediterranean. Casablanca, Naples, Athens, Alexandria, Suez, Bombay, Bali, Singapore, Hong Kong, Yokohama, Honolulu, Acapulco and 12 more enchanting ports. Perhaps your most memorable travel experience.
From $6,520 to $19,695. See your travel agent or mail the coupon.

See your travel agent or call Miss Martin collect at (212) 760-3880, toll-free at (800) 221-6657.

Holland America Cruises, 2 Pennsylvania Plaza, N.Y., N.Y. 10001.
Please send brochure on the s.s. Rotterdam 1976 World Cruise.

Name_____
Address_____
City_____ State_____ Zip_____
117-WC-5
Travel Agent_____

The s.s. Rotterdam is registered in the Netherlands Antilles. Rates per person, double occupancy, subject to availability.

Minimum rates may not be available on the above listed sailing.

You may never want to get off.

Holland America Cruises

are an environmentalist since most environmentalists are against it).

Technology Review (volume 77, number 4) weighs in with a host of energy reports, beginning with an analysis by four economists; their assessment of nuclear energy is as dismal as their science. They suggest that the capital costs of building nuclear plants have risen so much that the advantage of an inexpensive fuel cycle has almost been offset—as compared to the costs of using coal-powered plants. The reason: Rising costs of labor and construction are not, they say, as important as the delays that have been caused by political opposition—by the "fundamental debate on nuclear power within the U.S. community."

Elsewhere in the same issue, Dr. Lewis Conte of the Rhode Island School of Engineering says, essentially, never mind what kind of power plants we use, we can't make enough of them to keep up with the present rate of demand. Even if conservation measures cut the demand growth rate in half, it means that each state, on the average, will have to house 30 10,000-megawatt power plants by the year 2000 (which, by the way, is only 25 years off). That cannot be achieved, says Conte, because there aren't enough skilled people around to build them, they are getting too expensive anyway, and it's hard to find places for them.

On the happier side of the page which bears Dr. Conte's discomfiting remarks is a report about a "black box" that will provide "fuel-free electricity." Thermo Electron Corporation of Massachusetts is developing a Rankine engine that uses organic liquid instead of water to make gas that turns a turbine. The organic liquid, trifluoroethanol, becomes a gas at much lower temperatures than water becomes steam. In fact, it can use the waste heat from diesel engine exhaust, gas turbine exhaust, and solar and geothermal sources (400-1,000 degrees Fahrenheit).

They are experimenting with the idea of adding the black box to a diesel-fueled power plant and they expect to increase the overall efficiency of power generation to 50 percent (now it's about 40 percent).

Technology assessment

Pictured on page 26 is an ultimate achievement of the human imagination—a perfect tool. However humble it may

If you think the charm of Puerto Rico is unique

let us tell you about the bonds of Puerto Rico.

The bonds of Puerto Rico offer investors a remarkable (and rewarding) feature.

On the interest you receive from them, you pay no Federal income tax. No state income tax. No local income tax. No income tax of any kind—no matter what state you live in.

And behind the bonds of Puerto Rico lies an extraordinary transformation that has changed the island, in less than three decades, into one of the world's major industrial areas.

Nearly 2,000 manufacturing plants have been established in the Commonwealth of Puerto Rico—with more than 1 out of 5 of Fortune's 500 leading U. S. industrial companies represented. They range over virtually every field of contemporary technology and sophisticated operation, from petrochemicals and pharmaceuticals to scientific instruments and electronics-electrical equipment.

The charm of Puerto Rico is changeless. But its investment opportunities are very much of today. We'll be glad to send you detailed information about these totally income tax-exempt bonds. Just write to the address below.

Government Development Bank for Puerto Rico

140 Broadway, New York, N.Y. 10005 Dept. S-1

Fiscal Agent for the Commonwealth of Puerto Rico and its public Authorities:

Water Resources Authority · Highway Authority · Telephone Authority · Aqueduct and Sewer Authority
Ports Authority · Public Buildings Authority · Industrial Development Co. · University of Puerto Rico
Municipal Finance Agency · Urban Renewal and Housing Corporation · Maritime Shipping Authority

"Escape from the Ordinary"™

Norm Thompson Tyroleans

–Sport shorts designed by professional loafers Made better for us amateurs.

You see them on Alpine guides, professional hunters, people who direct leisure fun at summer resorts. Tyroleans are worn by professionals whose work is so much fun, *it seems like loafing.*

We've taken the good looking, functional European design. Added American comfort and easy care. Tailored them with double-stitched seams for durability— *kept the slim look* and *4 practical pockets* in front. (Men's shorts also have 2 rear pockets.)

Cut for action, Tyrolean shorts are comfortable when you move—comfortable when you're just relaxing. They look slim and trim all the time.

Tyroleans are also available in slack length, shipped unhemmed. Both are made of cool, lightweight Tundra cloth, 50% cotton, 50% dacron. Easy-care . . . just wash and wear 'em. Color: Tan. Men's even waist sizes: 28-44. Women's even sizes: 8-20. Slacks: **$16.50 ppd.** Shorts: **$14.00 ppd.**

Norm Thompson Dept. S-MY 1805 N.W. Thurman Portland, Or. 97209

Order (toll-free) anytime 800-547-6712 (Excluding Oregon, Hawaii and Alaska)

Tyroleans:	Qty.	Size		Qty.	Size
Men's shorts			slacks		
Women's shorts			slacks		

☐ Check enclosed. Charge to my:
☐ BankAmericard. ☐ MasterCharge.
(Please include all raised letters and numbers.)

Card #

Signature X

☐ Send FREE 40-pg. Spring & Summer color catalog. Save up to 1/3 on imported sports clothes and equipment.

Escape from the ordinary

Name

Address

City

State Zip

seem, there is really no *better* way to open a can than to use this tool (below). All changes in design since wrought thereupon have been a waste of time.

An ultimate human achievement.

Consider: A manual can opener screwed to a wall adds virtually nothing to the speed or ease of the process, uses more materials to make, and is more difficult to keep clean. An electric can opener is not much quicker (who needs to measure their lives in seconds anyway?) and any convenience gained by not using the wrists to open a can is surely exercise ill lost. It also uses more materials to make, and electricity to boot.

The basic type of can opener pictured here has none of these disadvantages: it has fewer moving parts, it is plenty fast enough and, importantly, it is portable. It is an instance where technological progress could have ceased to no one's real disadvantage—an instance where "improvements" have simply not improved the tool. (There could be one variant: a left-handed edition).

Since it is becoming quite clear that our society cannot go on in the rampant manner we are used to, since there is a vast and real need for technological improvements in other arenas, it may well be that inventiveness among us should be more precisely focused, that a moratorium should be declared on all unnecessary technological alterations.

There must be many other cases where technology has already basically fulfilled a function adequately, instances where no further "improvements" were necessary. This column would be delighted to publish short, well-described, well-argued examples.

JAMES K. PAGE JR.

if you like History

You'll Love Maryland

From Colonial times to the Space Age, the history buff will discover a lot to fascinate him. Whatever your taste in vacations, you'll find it right here in Maryland. Maybe that's why we're known as **"America in Miniature."**

Write: Tourism, Annapolis, Maryland 21401

Thos. Moser

Cabinet Maker

Solid cherry handcrafted furniture maintaining the purity of contemporary and traditional schools of design.

Catalog $1.00

27 Cobbs Bridge Road
New Gloucester, Me. 04260

"The Panda that went to China..."

When Helen Boehm was the guest of the Chinese People's Republic, she gave this enchanting porcelain sculpture to Chinese porcelain makers in tribute to their great heritage.
Now you can own this delightful new sculpture with its historic legend inscribed on the base.
8" wide $400 postpaid.

pitt petri

378 DELAWARE AVE./BUFFALO, N. Y. 14202

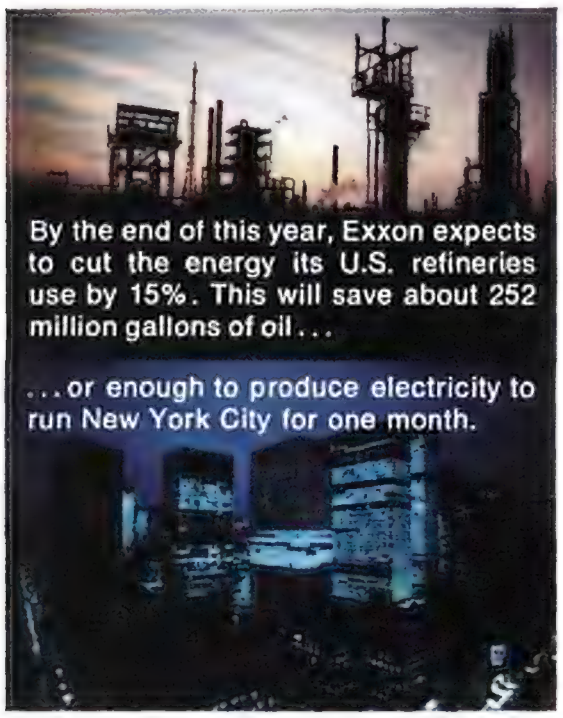
Saving energy

American industry offers a tremendous potential for energy savings right now.

One way to reduce our dependence on foreign oil is to use energy more efficiently. This means using less electricity and heating oil in our homes and saving gasoline in our cars.

American industry also offers a great potential for using energy efficiently Why? Because industry uses at least one-third of all the energy consumed in the U.S. today.

Exxon will save enough energy to run New York City for 30 days.
All major industries require large amounts of energy. In fact, 25 percent of all our energy is consumed by just six industries: farming and food processing, aluminum, chemical, iron and steel, paper, and petroleum refining.


By the end of this year, Exxon expects to cut the energy its U.S. refineries use by 15%. This will save about 252 million gallons of oil...
...or enough to produce electricity to run New York City for one month.

In the case of Exxon, we use energy to make energy. But, by the end of this year Exxon expects to cut energy usage at our U.S. refineries by 15 percent of what we used in 1972. The energy we save could heat the homes in Pittsburgh for one year or provide enough electricity to run New York City for one month.

No more "full speed ahead."
A ship captain can save fuel the same way you save gasoline in your car. By slowing down our U.S. tankers and towboats and by cutting nonessential power demands, Exxon saved 5.5 million gallons of fuel last year. That is enough to power 5700 farm tractors for a year.

Exxon's U.S. tankers reduced fuel consumption by 5.5 million gallons last year...
...or enough to fuel 5700 average-sized farm tractors for one year.

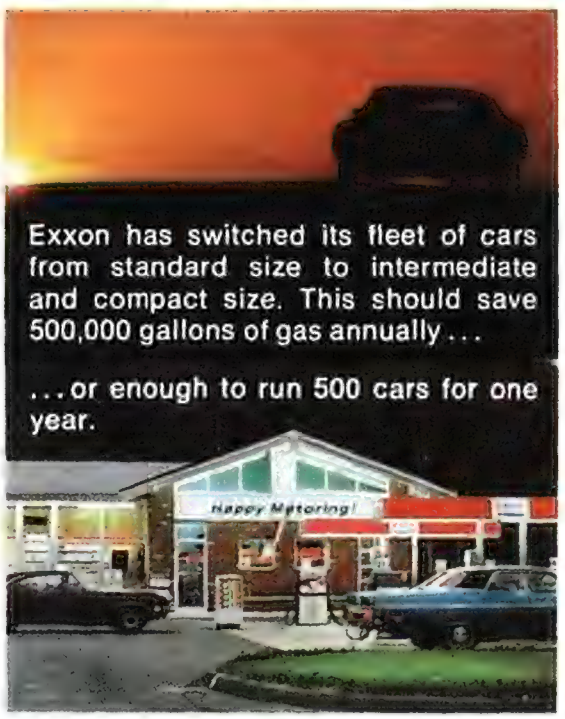
Last year, our 54-story headquarters in New York cut energy requirements by nearly 35 percent. Our Houston office reduced consumption of electric-

Exxon's Houston office has reduced its annual electric consumption by 7.3 million kilowatt-hours...
...or enough to provide electricity for 575 average-sized homes for one year.

ity by 7.3 million kilowatt-hours. That is enough electricity to power 575 average-sized homes for one year.

Recently Exxon switched all company cars from standard size to intermediate or compact size. We expect that this will save 500,000 gallons of gasoline annually—or enough to run 500 cars for one year.

There is evidence of progress.
As a nation, there is evidence that we are making progress on curbing


Exxon has switched its fleet of cars from standard size to intermediate and compact size. This should save 500,000 gallons of gas annually...
...or enough to run 500 cars for one year.
Happy Motoring!

energy use. Figures from the U.S. Bureau of Mines and the American Petroleum Institute show that demand for energy *dropped* 3.3 percent in 1974 as compared to 1973. Gasoline consumption alone dropped 2 percent.

Take a good look at how you run your operation, whether it's a corporation, a small business, or a home in the suburbs. We think you'll be surprised at the ways you can use energy efficiently to conserve our nation's energy supplies. And you'll save money too.

EXXON

Around the Mall and beyond

Herewith a new column, following Mr. Park's "200 years ago this month." Further details appear in May events at the Smithsonian (p. 110).

A couple of Smithsonian maintenance men, not so long ago, were shifting air and space exhibits around in the Arts and Industries Building—that huge brick complexity that raises its vaguely Byzantine turrets beside the Castle. They were using a forklift, a well-worn machine of sturdy character and chipped yellow paint, and, to their annoyance, they ran out of fuel.

Knowing that the museum doors would be open to visitors within a few minutes, they roped off their machine to keep curious youngsters from crawling onto the driver's seat. They strung a rope around the forklift and then around two neighboring exhibits—the space capsules of Alan Shepard and John Glenn—and hurried away.

By the time they returned, the front doors had opened and the museum was aswarm. An attractive suburban matron paused beside the rope and examined the forklift. She turned to her husband.

'Do you mean to tell me that *that* thing got to the moon?"

He looked at her with monumental scorn and superior knowledge.

"If it didn't, would it *be* here?"

I thought of this the other day as I passed the very spot (though Glenn's capsule has been moved, presumably by that forklift) on my way over to the Castle. There can hardly be another organization so fully accepted on faith as this awkward, often unexplainable, exciting Institution. Who knows, I asked myself, what mysteries lurk beneath the Castle's ivied crenellations. Yet I was hopeful of learning more about one of those mysteries, the Wilson scholars.

The Woodrow Wilson International Center for Scholars, as it's more properly called, should not be confused with the group of almost the same name which

People all over the world talk the same language about the DC-10: "I like it."

Chicago...
"I like it."

Rome...
"Veramente fantastico."

If you've already enjoyed flying on a DC-10, you've shared a pleasant experience with millions of other people.

resides at Princeton. Our Wilson scholars research and write their books in the Castle, often meet for lunch or sherry and sometimes pretty exalted conversation. They are now marking five years of existence by contemplating publication of a quarterly.

The appointment of Elliot Richardson as Ambassador to the Court of St. James's drew some attention to the scholars, because he was one. He joined soon after the "Saturday-Night Massacre," giving rise to a suggested inscription to go over the scholars' reception desk: "Give me your unelected, disaffected. . . ."

Actually, says James Billington, director of the Center, the notables who join—the current fellows include former Ambassador George F. Kennan, General Andrew Jackson Goodpaster, former Governor John J. Gilligan of Ohio, Zewde Gabre-Sellassie, former Deputy Prime Minister of Ethiopia—come here by invitation, as opposed to the brutally competitive admission of 80 to 90 percent of the appointees. The Smithsonian

George F. Kennan, his daughter (Mrs. John Carl Warnecke) and Felix Gilbert at reception following Kennan's colloquium. Dr. Gilbert moderated.

Copenhagen...
"Den er sken."

Frankfurt...
"Ein phantastisches Flugzeug."

Dakar...
"J'adore."

New York...
"I like it."

Tokyo...
好きですね

Paris...
"J'aime beaucoup."

Hong Kong...
我中意

Caracas...
"Me gusta."

Each day, more than 75,000 travelers fly a DC-10 to more than 120 cities in 67 countries. In many languages, they say they like the spacious, quiet comfort of the DC-10. So, ask your favorite airline or travel agent to book you aboard the DC-10—the choice of 34 airlines.

MCDONNELL DOUGLAS

GORHAM PRESENTS
ONE OF THE GREAT WORKS OF ART OF THE 19th CENTURY

Antique Apostle Spoon Collection

NOW PART OF THE PERMANENT COLLECTION
OF THE BOSTON MUSEUM OF FINE ARTS

This widely acclaimed Gorham Sterling Apostle Spoon Collection originally crafted 100 years ago is now reissued by The Gorham Company in very limited edition from the original century-old dies and molds. One of the most valued collections of our time, each of the 13 Spoons is a work of art in solid Sterling Silver with hand-sculptured figures on elaborately detailed stems. Total price of the Collection is $1,000 and is also available on a monthly subscription basis. Send for complimentary, fully illustrated brochure by completing the coupon below.

Apostle Spoon Collection
The Gorham Company, Dept. 207-21A
Providence, Rhode Island 02907.

Please send me your complimentary Apostle Spoon brochure containing complete details of this Sterling Silver Collection.

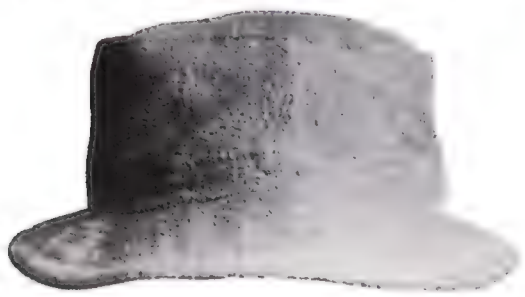
NAME_____

ADDRESS_____

CITY_____

STATE_____ ZIP_____

Talented Little Towel



Absorbent terry cloth towel is shaped into the Eddie Bauer Toweling Hat to outsmart summer heat two ways! When your brow is perspiring, just wipe it with your hat. Or douse your hat in water, wring it out and wear it to keep you cool at tennis, golf, boating, fishing, camping. **Sizes:** S(6¾-6⅞), M(7-7⅛), L(7¼-7⅜), XL(7½-7⅝), XXL(7¾-7⅞). **Colors:** Sailing Blue, Powder Blue, White, Yellow. **2002** Toweling Hat, **$4.95** ppd.

Order Today! Money Back Guarantee!

Enclosed is my check or money order for $_____. (Add sales tax where applicable.)

Please rush my 2002 Toweling Hat.

Size_____ Color_____

Name_____

Address_____

City_____

State_____ Zip_____

☐ Send me FREE your color catalog of over 1200 exciting outdoor products.

Eddie Bauer®

Dept. WSM, 1737 Airport Way S., Seattle, Wa. 98134

welcomes the big names, but screens them carefully so they will fit the Center's hoped-for breadth of background, of scholarship, of nationality.

On the average, the fellows who have been selected on a competitive basis are 43 or 44 years old, academic in profession and have already published work serious enough to make them widely known in the halls of academe. Peter Braestrup, formerly a staff writer for the *Washington Post,* tells me that there were more than 140 applicants for eight available slots in the last round of competition, and that the chosen few must not only produce a written work in their field, but withstand the rigors of a colloquium, defending their theses against the destructive barbs of their colleagues. This discipline goes for the notables, too. Jim Billington says that generals or governors or whatever are suggested in the first place because they are sound scholars underneath all the brass and office trappings. General Goodpaster, for example, has a Ph.D. in International Relations.

The concept of the center was a gleam in President Kennedy's eye as far back as 1961. He admired Woodrow Wilson and considered this idea of a scholarly elite as an alternative to another marble monument in the nation's capital. Vice President Hubert Humphrey then carried the ball. It turned out that his father was a devoted Wilson supporter, and HHH helped push the scholar idea and became the first Chairman of the Board of Trustees of the Center. The first fellows arrived in October 1970. There wasn't as much competition in those days, says Braestrup. "I'm not sure I could have made the grade if I had applied under Billington," he says, with almost embarrassing modesty. Braestrup is working on the media treatment of government policy issues—a juicy enough subject to provide some flavor to his memories when he has left the old red sandstone tower and gone back to the late hours of a morning newspaper.

The first generation of Wilson scholars focused their work on environmental studies such as the Law of the Sea (meaning, among other things, who controls offshore oil drilling). Billington's group is more diversified. He also is trying, perhaps hopelessly, to break down the elitism of the scholars with what he calls an "outreach" program of writings and discussions to which an audience would be invited. The material, of course, would be part of the fabric of the new quarterly.

Yet the Wilson scholars remain pretty rarefied. Their projects are not exactly topics of excited speculation among the throngs that visit the Smithsonian. And these scholars themselves, so meticulously chosen with an eye to academic achievement and also geographic, national and political distribution, are certainly not the slightest bit aware of the clamoring sightseers. Of all the quiet researchers around the Mall, the Wilson scholars may well be dubbed the most aloof, the least understood and, despite some of their famous names, the least *known.*

At the other end of the Smithsonian spectrum, across the Mall from the Castle, is the splendid History and Technology Building. In directing a taxi driver to it you can usually get there by calling it "the building with the locomotive in it," just as you can define the Arts and Industries Building as "the one with the planes hanging from the ceiling."

Anyway, along with that locomotive there is a maritime exhibit consisting of a vast fleet of model vessels. The hall is introduced to the casual visitor by one of those talking heads that the Smithsonian uses—a costumed statue with a blank plastic head on which is mysteriously screened the moving picture of a man's face. Thus the plastic becomes alive with features and changing expressions; the lips move and words come out of them, via sound track.

The talking head at the Hall of Maritime Enterprises is, inevitably, a ship's figurehead—a clothed masculine figure, in case you're wondering. And, with eerily moving features and blinking eyes, he tells you about maritime history. He wakes up, at first, as though he had been catnapping in a lashed-down deck chair beside the helm of a Black Ball packet. Sleepily, he grumbles about the way the ship is behaving, then livens up and bellows for the mate—obviously a dolt who is doing everything all wrong. Finally, this crusty old skipper notices the tourists standing beneath him and proceeds with his lesson.

All very effective. And perhaps more so because the filmed face is that of Mel Jackson, the man who runs the exhibit. And Mel really *is* a crusty old salt with a quarterdeck voice who obviously feels that most ships' mates *are* dolts.

The woman I love doesn't wish
she was twenty or pretend she is thirty because
whatever she does, she does better at forty.

A diamond is forever.

A gift of diamonds need not be expensive. Your jeweler can show you many exciting pieces starting as low as $200. De Beers Consolidated Mines, Ltd.

RUSTIC?

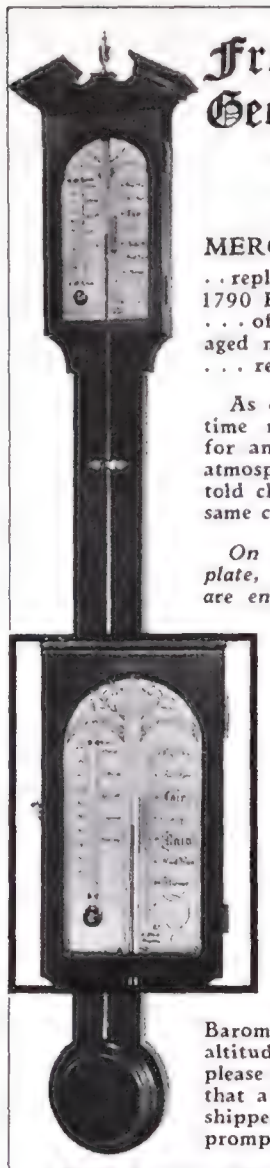
Ward Cedar Log Homes do not compromise quality of materials, workmanship, design characteristics, or service. Rather they are the end product and ultimate evolution of years of careful planning, material selections, and manufacturing techniques. These buildings may be the most modern, convenient, and prestigious "rustic" homes on the market today.

WARD CABIN CO.
HOULTON, MAINE 04730

WARD CABIN CO.
Box 72 SM-5
Houlton, Maine 04730
Please send:
☐ Free Ward Folder
☐ Complete Brochure
($2.00 is enclosed)

NAME _____
Address _____
City _____ State _____ Zip _____

From England's Georgian Period Circa 1790



A Magnificent
MERCURY BAROMETER:
. . replica made in Brighton of a 1790 English scientific instrument . . . of hand-finished solid dark aged mahogany (antique finish) . . . ready for immediate use.

As did gentle persons of that time refer to their barometers for an indication of changes in atmospheric pressure which foretold changes in the weather, the same can be done today.

On its silvered brass register plate, the writing and numbers are engraved in scroll lettering.

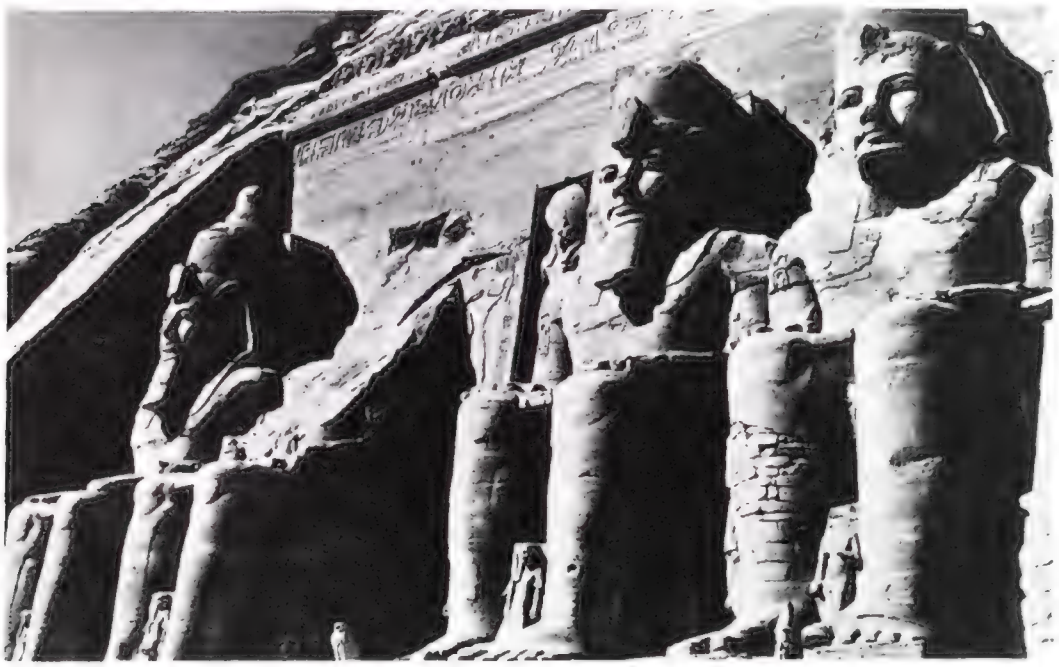
A sliding Vernier allows readings of 1/100 inch and a Fahrenheit thermometer is attached to the register plate. A beautiful functional instrument indeed, to match any decor in the professional office, den, hallway — a perfect piece for that "difficult" area to decorate.

38½" x 5¼"

$175 delivered to your door. (Calif. residents, add $10.50 tax). Workmanship Guaranteed! If Barometer will be used at an altitude higher than 1500 feet, please indicate that altitude so that a correct instrument can be shipped. Inquiries welcome and promptly answered.

British-American Historical Arts, Ltd. Dept. S 402
10884 Santa Monica Blvd. • Los Angeles, Ca. 90025

TRAVEL THE WORLD OF LINDBLAD



JOURNEYS INTO ANTIQUITY

Lars-Eric Lindblad offers three journeys of classic beauty into Egypt's ancient past. You may desire to travel "A Thousand Miles Up The Nile." You may want to explore "The Blue & White Nile," which includes an expedition into Ethiopia. Or you may want to embark on a journey to "Lands Of Antiquity" which, in addition to Egypt, will take you to Greece and some of its historic islands. These three tours feature unique and exciting excursions into unrivaled archeological places. You will marvel at the sight of great temples and relics of true antiquity. SABENA AIRLINES—the finest in air travel will take you to Egypt and back. Write for our informative brochure.

LINDBLAD TRAVEL, INC.
Dept. SN575
133 East 55th Street, New York, N.Y. 10022
(212) 751-2300

Mel Jackson has been getting a big marine engine installed in the lower level of his area to show people how it works. It came from the Coast Guard buoy tender *Oak,* which was accepted by the Smithsonian in 1964 when she was taken out of commission. Since then, the tender has been maintained by the Armed Forces Museum Advisory Board, and recently Mel has had the task of snaking that great engine out of her while the vessel lay in Curtis Bay near Baltimore.

Mel and two others, John Stine and Jim Knowles, got into the habit of buzzing off to Baltimore every Wednesday armed with sandwiches, beer and a broken-down acetylene torch. They would spend all day hacking through the spaghetti-like piping to free the 29-ton monster so that they could haul it out. They had little money but plenty of what Mel calls "maneuvering room"—meaning an awesome ability to scrounge and bargain that can only be compared to the kind of piracy practiced by World War II mess sergeants.

After a year of Wednesdays, Jackson and crew scrounged a crane and some riggers to remove the beast.

The crane was moved into position, the cables attached, the power applied. The crane creaked, the cables sang with tension, the very ship came six inches out of the water, but the engine didn't move.

One rigger, peering down at the action, turned around and started to say something very diffidently: "Ahh, say. . . ."

His boss turned on him impatiently. "Shut up, Donovan," he said.

The cables tightened again, the crane groaned, the whole bottom of the hull seemed to bend with the force, but 29 tons of Diesel stayed put.

"Aaaah . . ." began Donovan.

"Shut up, Donovan," snapped the boss.

One more try. Creak, whine, groan.

"Errr . . ." began Donovan.

"Oh, for God's sake, Donovan," said the boss, "what *is* it?"

Wordlessly, the incoherent Donovan pointed out a forgotten row of bolts, still doing their job. And so the great green beast, Donovan's Diesel, is now embedded in the Museum of History and Technology, within earshot of Mel Jackson's voice, waking up again and again and chewing out that fool mate, as though he were driving *Flying Cloud* through the roaring Forties.

EDWARDS PARK

Singapore

the sunny smile isle

As night falls, dine Singapore style at a sidewalk food stall. Taste delicious Malay mini barbecues and fresh seafood.

As a background, there are the sights and sounds of Singapore. An open-air Chinese opera, a Malay puppet shadow play or the dances of India.

But let's return to the food. Singapore is the only Asian center which offers the cuisine of half the world and more. Western cuisine or all-Eastern dishes can be tasted in the comfort of international restaurants. Or try mouth-watering Malay, Chinese, Indian, and Indonesian food prepared and served on the spot at tables along the sidewalk. Wave down a passing trishaw and take a ride down the tree lined waterfront. Take in the sunshine, the blue skies and the warm waters.

Enjoy Singapore any month of the year. A tropical island world in a clean, green, garden setting.

Singapore is a blend of many races. But you'll always have something in common, a commonly understood language. English.

Director — North America, Singapore Tourist Promotion Board,
251 Post Street, San Francisco, California 94108. Tel: (415)391-8476
Please send me FREE illustrated brochures on Singapore.

Name.....

Address.....

City..... State..... Zip.....

Come Share Our World

Singapore

SML505

By Timothy Green

Roosting birds and the dangers of a gas barge

In Trinidad conservationists, fishermen and boatmen battle a nationalized oil plant to preserve the great scarlet ibis spectacle

Half an hour before sunset the deep green mangroves clothing the islands of the lagoon are sprinkled only with a chattering colony of cattle egrets. Presently, as the light sinks, they are joined by a low-flying armada of snowy egrets winging across the water like the first swirl of snowflakes. A few little blue and Louisiana herons soon mingle with them. But 50 onlookers in a small fleet of green and red wooden boats moored to a row of stakes 100 yards from the islands hardly notice them. All eyes are turned skywards, scanning the horizon. Suddenly someone exclaims, "There's an ibis!"

A flash of pure scarlet comes streaking over the trees 200 feet up, circles for a second over an island, sideslips downward like an attacking Spitfire to perch atop a mangrove. A moment later three more scarlet ibis appear high in the sky, line astern, homing in toward the island; then comes a v-shaped squadron of a dozen, followed by a flight of nearly 50. Within minutes the sky is a flurry of red wings (see cover). The big birds come swinging in by the hundreds from all around the lagoon, as if marshaled by some unseen controller, to perform an aerial ballet in the sunset with all the panache of a fine old-style Hollywood musical. Finally, as the birds sink down to rest, the green mangroves seem to sprout huge, rich blossoms as their upper branches become laden with scarlet ibis, while the egrets form up in white tiers below.

This evening spectacle in the Caroni Swamp in Trinidad, as upward of 7,000 scarlet ibis and almost

Pelican, carrying liquid petroleum gas, lurches up the Blue River through the center of the Caroni

8,000 egrets settle down to roost, is one of nature's most exotic sights, an attraction that is magnified because it is the only colony of the scarlet ibis readily accessible to outsiders. Most of their other settlements are in remote swamps of the Orinoco River delta in Venezuela, or further south in Surinam or French Guiana.

But as the sightseers in Caroni are navigated homeward in the early dusk nowadays, they sometimes encounter a less agreeable sight. An ungainly barge, named *Pelican,* comes lurching up the narrow mangrove-lined Blue River that runs through the heart of the swamp a little more than half a mile from the roosting area. This leviathan, laden with 45 tons of

Swamp. An ecological threat, it is a half-mile from the ibis and egret roosting area.

liquid petroleum gas (LPG), is destined for a bottling plant just inland of the swamp which parcels up the gas into cylinders that many Trinidadians rely on for their cooking. Its thrice-weekly journeys, which began late in 1973, have sparked off the Caribbean island's first serious environmental battle.

On one side is the Blue River Action Committee, dedicated to "save our swamp," an unlikely alliance embracing wildlife enthusiasts and ecologists, with hunters, fishermen, oyster catchers and tourist boatmen (who all make their living in the swamp) and even trade unionists at local oil refineries (who joined in just to needle the government). They protest that

Without its steady diet of fiddler crabs, this ibis, held in a sanctuary, is beginning to lose color.

no industrial activity, especially one involving a barge with a highly volatile cargo, should be permitted on the very fringe of the island's finest bird sanctuary. Squared off against them are the government of Trinidad and the oil company that formerly owned and now operates the offending barge between refineries in the south of the island and the LPG bottling plant close to the capital city, Port of Spain.

Originally the barge was operated by Shell Trinidad, a subsidiary of Royal Dutch Shell, but in August 1974, because of the furor, the Trinidad government nationalized the company. It became the Trinidad and Tobago Oil Company (Trintoc). This subtle change in the cast of characters is important. Instead of taking on Shell, a relatively easy target in Trinidad as a foreign multinational company, the environmentalists suddenly were faced with the government-owned operation. Since several of the leading protestors are civil servants, that poses a difficult conflict of interest with their own jobs; a government employee cannot lightly take on his own boss.

An extra touch of drama is added because the scarlet ibis, the colorful cause of the row, is designated as

Photographs by George Silk

Sharing the abundant shellfish of the shallow waters with the ibis are egrets, herons and yellowlegs.

Trinidad's national bird. It adorns postage stamps and supports one side of the nation's coat of arms, above the motto "Together We Aspire."

Actually, the argument over the barge has really only brought to a head a long-simmering controversy about the future of the 7,900-acre swamp around the tributaries of Trinidad's largest river, the Caroni. For more than a decade the Wildlife Conservation Committee of the Ministry of Agriculture has been arguing for an extension of the existing bird sanctuary in the swamp. At present it covers only 494 acres of the main roosting area and one small nesting area of the scarlet ibis. A blueprint that committee members put forward to extend the sanctuary to a full 4,700 acres, including the birds' main feeding grounds, has been gathering dust for more than five years on ministry shelves.

The debate on Caroni, moreover, involves more than just the fate of the scarlet ibis. One hundred and thirty-eight bird species have been sighted there; 54 varieties are known to nest. Eight kinds of herons live there; so do the rare white-cheeked pintail and the elusive spotted rail. The sharp-eyed may even spy the common potoo (known locally as "poor-me-one"), a master of camouflage that drapes itself on the top of a tree stump so that it is often indistinguishable from the bark, except when a breeze ruffles its feathers (see page 39).

Besides the birds, the silky anteater and the crab-eating racoon may be found amidst the mangroves. The roots of mangroves are thickly clustered below water level with oysters and mussels. The swamp is also probably a breeding ground for the fish and shrimp that later provide good catches for Trinidad's fishing fleet out in the Gulf of Paria, which separates the island from Venezuela. Any long-term ecological damage to the swamp, therefore, could seriously damage the wildlife populations and undermine the local commercial fishing industry.

Alligators are only occasional visitors, sand flies and mosquitoes are troublesome only close to the mangroves in the evening. The abiding impression of Caroni is of long moody waterways that lead into great lagoons where stately herons stalk across the mudflats and gallinules paddle through the shady shallows.

The scarlet ibis, the swamp's main attraction, are rarely glimpsed by day. They leave the roosting area in a scarlet cloud within minutes of first light and vanish deep into the mangroves of their feeding grounds. But they are gregarious birds and usually remain in groups of anything from a dozen to 50 as they eat. Their favorites are fiddler crabs—the diet that gives them the scarlet plumage (in captivity the birds swiftly fade to a dull pink if deprived of this regular supply of carotenoids).

Although the scarlet ibis is not classed as an endangered species, some bird watchers of long standing on Trinidad declare that their numbers have been depleted seriously over the last generation. Richard Deane, who runs a wildlife trust about 20 miles south of the Caroni Swamp, told me that "40 years ago there were three times as many. The whole northern range of the swamp turned red when they came in to roost. But many were killed during the war when the [British] Fleet Air Arm used them for target practice."

However, Richard ffrench, the Island's leading orni-

A frequent SMITHSONIAN *contributor, Mr. Green wrote of Britain's National Trust in last month's issue.*

Each evening the birds also share swamp
with tourists packed into flat-bottomed boats.

thologist and author of *A Guide to the Birds of Trinidad and Tobago,* reports that he has observed no decrease since he started studying them in 1956. In fact, a quick bird count he undertakes every Christmas has indicated an increase, if anything. He estimates the full population at 7,000 or more.

There is cause for concern, however, as to whether the birds still nest in Caroni. ffrench himself counted 2,500 nests on a five-acre site in 1963, but believes ibis have bred only erratically in the swamp since the mid-1960s. The game wardens who patrol the swamp agree with his assessment. ffrench argues that the birds now migrate south and west toward Venezuela and the Orinoco River delta to breed. A Dutch ornithologist, Arie Spaans, who has been studying them on the mainland of South America, has recently confirmed this. Spaans has identified a breeding colony on Cotorra Island near Pedernales on the north branch of the Orinoco River delta. This fits in with regular sightings each summer of young ibis, with distinctive grayish-brown and white plumage (the scarlet dress does not appear until they are about a year old), winging in to Caroni over the Gulf of Paria from the general direction of the Orinoco.

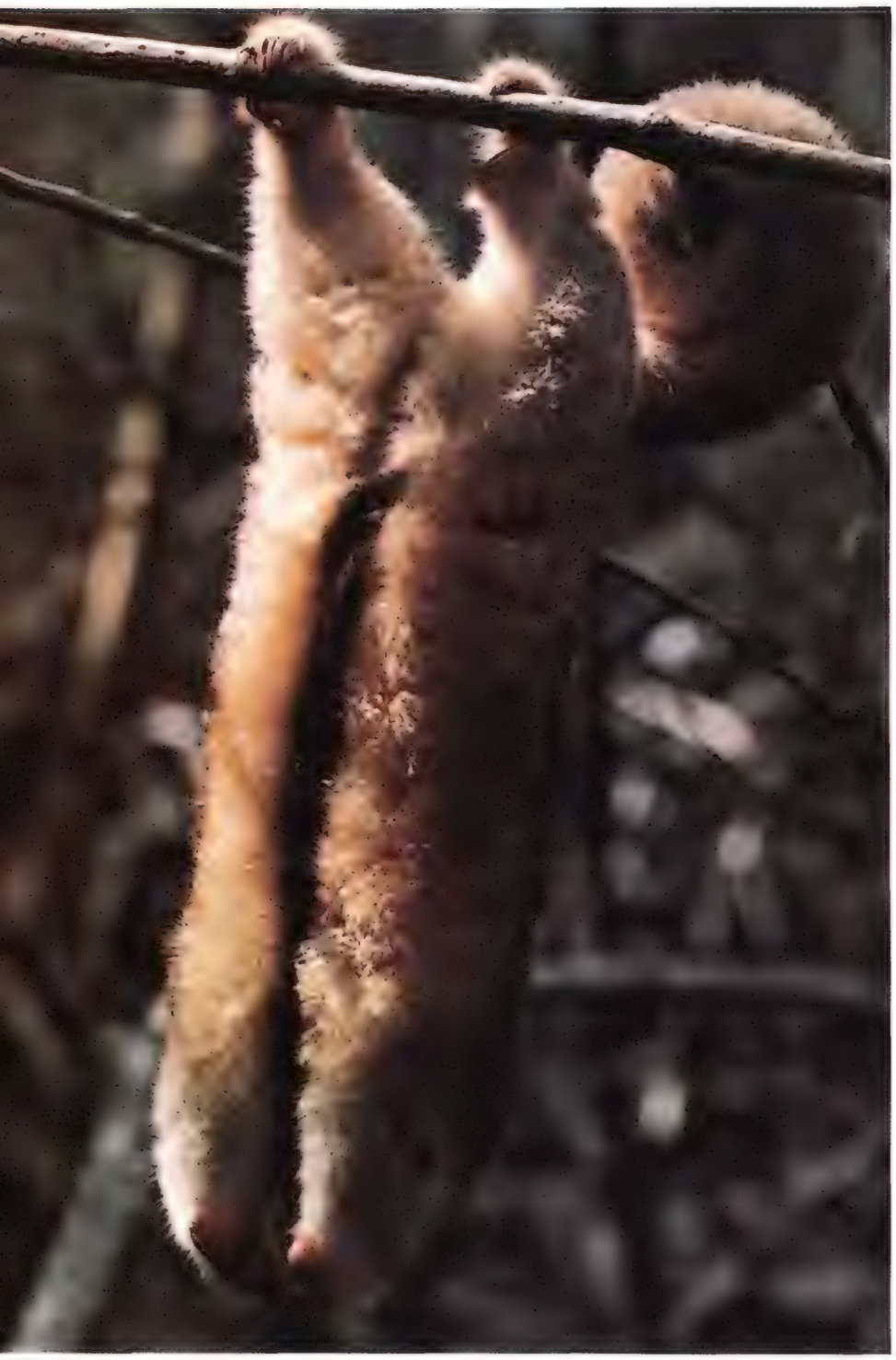
Some local boatmen, who work in the swamp daily, insist that the scarlet ibis still nest there, too. Winston Nanan, a knowledgeable young guide who specializes in taking visiting birders into the swamp, told me he saw several hundred nests there in 1974 and photographed the birds on them. He said that the new nesting area is deep in the mangroves, half a mile from the nearest navigable channel and reached only by wading chest deep in mire.

A retreat by the scarlet ibis into either inaccessible areas of Caroni or to offshore islands to nest is entirely understandable, for they are exceptionally shy birds, alert to any unexpected human intrusion. For years they were hunted indiscriminately in Trinidad, both for their feathers and as a tasty dish. They were given limited protection in Trinidad in the 1950s, and for the last decade have been protected completely. But the swamp is patrolled by only four game wardens during the day and none at night, so poaching still takes place. Tales circulate of very senior Trinidad citizens who rate roast scarlet ibis as a specialty of their table at important parties. Any real threat nowadays, however, comes not so much from the gun as from industrial and tourist development.

The evening spectacle is second only to the annual carnival as Trinidad's best tourist attraction. The tourists arrive in a growing fleet of unlicensed flat-bottomed boats, powered by noisy outboard motors that are constantly breaking down. Conservationists in Trinidad are alert to this problem. They would like to see the boats licensed, and a boardwalk built in from the Blue River to the main lagoon, so that boats need not go close to the birds at all. And this should be but part of a wide-ranging policy for the long-term preservation of Caroni.

There is also an urgent need to regulate the oyster catching in the swamp. Some of the harvesters simply cut off whole mangrove roots, along which oysters grow like onions on a string, thus destroying the immature ones at the same time as the edible ones.

"The damage to the swamp can be slow and insidious," said Professor Julian Kenny, of the University of the West Indies. "It can creep up on you year after year—like the oyster problem in Chesapeake Bay.



Silky anteater is among swamp's species of mammals, all of which play second fiddle to the birdlife.

There is already pollution of the northern end from industrial effluents pumped into the Caroni River. We need to check that it isn't spreading. What we really need is for the government to set up a biological team to systematically monitor the swamp over a period of years."

Banning of the LPG barge must be an integral part of any such program, even though it was custom-built for this job on the Blue River. The engines of the 91-foot by 23-foot vessel are totally self-contained; their exhaust is not discharged into the water and they are reasonably and effectively silenced. The boat has special keel coolers which are self-enclosed so that no cooling water is discharged. However, while this may insure that there is no pollution on its normal journeys, the threat of some major disaster which might cause irrevocable damage to the swamp is ever present. A sharp reminder of this came within weeks of the start of barge operations, when the kitchen aboard caught fire. Luckily the blaze was swiftly contained on that occasion.

An additional hazard is the vessel's unwieldiness. It veers from side to side in the narrow channels like a drunken rhinoceros, bouncing from bank to bank as it goes. The mangroves on either side of the Blue River suffer considerable battering. The propellors also churn up the shallow bottom like a mixer whirling milk shakes. Some boatmen on the river say they have seen dead fish in its wake.

Furthermore, the regular dredging now required in the Blue River and canal up to the bottling plant may be causing long-term changes in the swamp. Local boatmen report that the dredging is causing the river to flow faster, thus draining off water more rapidly and lowering the water table. As yet there is no scientific study to back this up, but if their claim is true, this could radically alter the swamp and ruin it as a nursery for fish, shrimp and oysters, and as a feeding ground for other animals.

The arbiter's findings were unequivocal . . .

The pity of all this is that early in 1974 the opponents of the barge thought they had Shell Trinidad and the government licked. Both sides had agreed to accept the findings of an independent arbitrator, Dr. Edward Towle, president of the Caribbean Conservation Association and an accepted authority on environmental problems in the region. Dr. Towle was invited to Trinidad, at the expense of the Ministry of Petroleum and Mines, to review the issue. His report was unequivocal. The Shell barge operation should be stopped, and the government should swiftly develop the Caroni Swamp as a national park. He added that Shell's argument that they needed to use the barge

to avert a shortage of gas to customers was not true. They could manage, as they had done before the barge was built, with a road tanker fleet. The shortage of LPG at retail level then prevailing was purely artificial, according to Dr. Towle. "Shell distributors seem unaware that Shell has 'created' the shortage," he charged, "and honestly believe that the conservationists' objection to the barge operation is the reason for the 'shortage.' This is most unfortunate and Shell duplicity should not go unexposed."

. . . but the report went unheeded

Dr. Towle recommended that as a matter of top priority Shell should be required to build an LPG pipeline from a shore site they owned just north of the Caroni Swamp to the bottling plant. The barge could deliver to this site and would not have to navigate through the swamp itself. Unfortunately, the Towle report has been lying unheeded at the Ministry of Petroleum and Mines since December 1, 1973. It has never been published formally and, when a copy was leaked to a local newspaper, Shell Trinidad threatened it with legal action to stop publication. Shortly after the report was completed, Dr. Eric Williams, Trinidad's Prime Minister, went on television to announce that because of the "shortage" of LPG gas the barge would be permitted to make a limited number of trips to build up stocks. That was just before Christmas 1973; the barge has run without interruption ever since.

Today, the Blue River Action Committee that started the "save our swamp" campaign is disheartened. "The government has ridden roughshod over the objections of environmentalists," said ornithologist Richard ffrench bitterly.

The government itself seems in no mood to change its mind. I asked Trinidad's Minister of Agriculture, Lionel Robinson, whose department presides over the Caroni Swamp and who is personally opposed to the barge, how things stood. "My view is that now the barge has started and been running for over a year, you can't stop it," he said. He added, significantly, "I know the thinking of the cabinet on this."

As for Trintoc, the nationalized version of Shell, they ducked the issue completely. Their chief spokesman told me the matter of the barge was "being held in cold storage," because discussions were currently taking place to merge Trintoc with another government-owned oil company, Trinidad Tesoro. "We can't take a decision one way or the other that would bind a future operator," he said.

"What about the proposals to replace the barge with a pipeline?" I inquired.

"There is no new thinking on the pipeline," the

A careful look reveals a common potoo, a master of camouflage, draped around the top of this stump.

spokesman stated; "we can't take any decisions for the present."

All this gives little encouragement for the future preservation of one of the Caribbean's finest wildlife areas. But at least some improvements in overall strategy toward the Caroni Swamp are occurring. The Trinidad cabinet has taken a decision "in principle" that Caroni should be a national park. The question is, when? Lionel Robinson, the Minister of Agriculture, could give me no real schedule. He hoped legislation might be introduced within a couple of years.

The Ministry's scheme will revive the long-standing proposals of their Wildlife Conservation Committee that almost 5,000 acres of the swamp south of the Blue River should be a sanctuary (increasing the present protected area tenfold). Most of the scarlet ibis feeding grounds, and the mangrove thickets where they nest, will be included. The tourist boat operators will be licensed. Fishing and oyster harvesting will be controlled by an increased staff of game wardens.

The catch is, of course, that these improvements will apparently be made while the LPG barge continues to ply the Blue River. I asked Agriculture Minister Robinson if the legislation that would be required to formally create the park might not be an ideal opportunity to put a stop to the Trintoc, or anyone else's barges. "No," he said, "there is a tacit agreement that the legislation can be done excluding the barge" from park controls.

This is hardly a satisfactory compromise. As Richard ffrench put it, "Caroni is a sanctuary for birds, and if you have any industrial activity in such an area, it makes nonsense of the whole concept."

The mangrove trees appear to bear colorful fruit as some of the 7,000 scarlet ibis roost in the evening.

By Madhur Jaffrey

The last chance, probably, to view a saint's remains

St. Francis Xavier's arrival in Yamaguchi in Japan, depicted on a modern screen by Nishiro Shinsen.

Long venerated for its 'incorruptibility,' the body of St. Francis Xavier—requiescat in pace—*shows the wear and tear of time*

They had been told that it might be the last public viewing of the body. So they stood for hours under the blazing tropical sun, in long winding queues, and waited patiently to file past the coffin.

The man who lay in the coffin had been dead nearly 422 years, yet his body seemed to be in an unnatural, perhaps miraculous, state of preservation. This was no ordinary man, however: He was Don Francisco de Yasu y Xavier, better known to the world at large as St. Francis Xavier and to the residents of what was formerly Portuguese India as "Padre Santo."

The glass coffin had been placed on a table that stood at the crossing of the nave and the transepts in the Sé (cathedral) of Old Goa. The unending flow of people entered the building in two parallel streams—one male and the other female. Both sexes came in through the same side door where a simple partition, made of metal pipes, kept them apart. Some men came in dark tropical suits; others, from outlying villages, came in *dhotis* and *kurtas*, carrying possessions wrapped in a bundle slung over their shoulders. And some men came in their underwear—sleeveless vests and striped drawers. The older Goan women often had their heads and faces covered with black lace mantillas. But the younger girls came bareheaded, in short skirts, hip-hugging pants or brilliant saris. Both men and women carried in their hands offerings of candles and money, as well as paper bags containing loaves of bread, buns, calendars, holy pictures and rosaries. Those among them who expected St. Francis, their patron saint, to perform some of his legendary feats of healing held crude wax models of noses, ears, breasts, teeth, arms and hearts. By offering them, they could indicate to the saint the location of their ailments and expect a quick cure.

Even as Mass is being said at a temporary altar in the nave, behind it pilgrims continue to stream past the saint's glass-enclosed remains.

As they neared the body, the two human streams diverged. The women went up the right side of St. Francis, around his head and then towards an exit; the men walked past the feet and up along the left side of the body. As the men and women filed by, they fervently pressed their loaves, rosaries and holy pictures against the glass coffin, hoping to save these precious products for a later date, not as a cure for any present ailment, but as an insurance against future mishap.

The "miracle" of the "incorrupt" body of St. Francis was, perhaps, that it had never decomposed. Over the many years of its existence it had slowly dried and withered—like an uprooted tree—but it had never rotted. Now, what with the frequent expositions (as the public viewings are called) and the humidity of the monsoon seasons, well, the clergy were beginning to worry.

The saint lay facing the high, vaulted ceiling of the vast, early-17th-century cathedral. Behind his head

Color photographs by Jehangir Gazdar

Among religious art stored in Bom Jesus is this painting on wooden panels of an earlier exposition.

was the gold-leafed altar dedicated to St. Catherine at a time of Portuguese glory more than three centuries ago—crumbling and cracking now, and smelling of bats. Beyond his feet, past the file of male devotees "kissing" the body, Masses were being held every hour in most of India's regional languages, and in English and Portuguese. This was to accommodate the pilgrims from the Indian provinces as well as the numerous visitors from overseas. For the first time in 13 years the territory of Goa was officially receiving visitors from Portugal. The rift caused by India's takeover of the Portuguese enclave of Goa in 1961 had at last been repaired. Hymns, set to popular film tunes, were also being sung, sometimes to the accompaniment of harmonium and drums.

Outside, the atmosphere was equally chaotic and festive. Temporary shopping malls had been set up between the cathedral and the Basilica of Bom Jesus (where the body of St. Francis normally resides in its silver tomb). The shops sold plastic figures of the saint, picture postcards of Goa, candles, wax anatomical parts, books by the Rev. Billy Graham, condensed lives of religious figures, Coca-Cola, whisky, coconut and cashew-nut *feni* (the popular local liquor), *sorpatel* (a spicy pork dish), household gadgets as well as toys and all manner of sweets. Most pilgrims seemed to have come to Goa for more than one reason. Of course they wished to be blessed by St. Francis, but they could also get some good food—Goa's hot sausages and crusty breads are famous all over India. They could go for walks along the many lush lagoons or take a dip in the warm waters of the Arabian Sea. And perhaps, just perhaps, they could get a quick look at all those nude hippies who were said to have colonized certain beaches and who were reputed to make their living selling hashish cookies in different flavors.

All this commotion and pageantry would stop abruptly at the close of the exposition, which had started on November 23, 1974, and would end on January 5, 1975. The port city of Old Goa would then go back to what it had been for more than two centuries—a ghost city with no homes, no markets, no docks and no residents—just a handful of priests living in scattered, dusty and crumbling houses of God. Cathedrals with fallen towers, towers with no churches, boarded-up chapels with cows grazing on the front steps, stray pillars and archways, flights of steps going nowhere—that is Goa today.

When Francis Xavier first landed in Goa, on the west coast of India, on May 6, 1542, it was known as one of the greatest port cities of the world. A popular saying at the time was, "If you have seen Goa, you do not need to see Lisbon." The Portuguese had captured and colonized it in 1510 and by 1530 it had been declared the capital of the enclaves that made up Portuguese India. More than a thousand ships touched port every year. Merchants from all over the world car-

Miss Jaffrey, born in India, is a free-lance writer and actress (she won acclaim in the film Shakespeare Wallah*) who now lives in New York.*

ried on a brisk trade in such goods as cotton, silk, gems, spices, slaves and Arabian horses. The population of Goa boomed to a quarter of a million. The walled city had paved roads, about 3,500 private homes, and about 50 churches, chapels and monasteries. *Fidalgos* (noblemen), attired in rich brocades, strutted along the streets, followed by large retinues of liveried slaves carrying their weapons, cloaks, hats, umbrellas, gilt chairs and cushions.

It was at this time (1539) that King John III of Portugal decided that land and trade were all very well, but he wanted to spread the Catholic faith. To this end, he appealed to Pope Paul III and asked him to send to the East some members of that new, vigorous and yet to be formalized order, the Society of Jesus.

Francis Xavier was born in Navarre on April 7, 1506, of a Basque-speaking noble family. While a student at the University of Paris, he came under the sober influence of Ignatius Loyola and was converted to his teachings. Together with a group of friends, he helped formulate plans for the future Society of Jesus (or Jesuits). When the Pope asked that he represent him in Portugal's Eastern empire, Xavier jumped at the chance. At their last meeting, Loyola is reported to have said to him, "Go set all on fire."

Xavier proceeded to do just that from the moment of landing in Goa. Wearing a rough, black cotton robe, he worked with the lepers in the hospitals, exhorted the libertine *fidalgos* on their morals, had translations made into the local languages of the Creed, Our Father, Hail Mary and the General Confession—which he memorized—and then he got down to the business for which he had come: the Christianization of the heathen world.

Between expositions, Xavier's body rests in this silver reliquary in the Basilica of Bom Jesus.

He died a hundred miles from his goal

Francis Xavier's boundless energy took him to Malacca, the Moluccas, Ternate, Halmahera, Morotai and to Japan. Wherever he went he worked feverishly —converting, baptizing and tending the poor and sick. Stories of his miracles always managed to precede him. He was said to have raised the dead, cured the maimed and calmed rough seas.

Xavier wanted very much to go to China to spread the faith, but that country was closed to foreigners. When his ship, the *Santa Cruz,* anchored at Sancian (called Shang-ch'uan today), an island a hundred miles from Canton, Francis bribed a Chinese trader with pepper. In return for this, the trader promised to smuggle Francis into China. The trader then disappeared—and never showed up again. Francis waited in vain. Frustrated and in sight of China, he died on Saturday, December 3, 1552.

He was given a quiet, simple funeral the following

Wax replicas of various parts of the body mingle with more conventional religious goods in the shops.

day, attended only by a Chinese convert, Antonio, two mulatto slaves and a Portuguese pilot of the *Santa Cruz*. Antonio later reported: "In death the blessed Father looked so happy and so fair that one might have thought him still alive. . . . I went at once to the ship to obtain the vestments and all else necessary for his burial. . . . We made a wooden coffin in which we placed the body clothed in sacerdotal vestments. . . . Having dug a deep grave, we lowered the coffin into it and were about to cover it with earth when one of the company suggested to me that it might be a good idea to pack the coffin with lime above and below the body as it would consume the flesh and leave only the bare bones, in case anyone in time to come should wish to take them to India. . . . So we withdrew the coffin, obtained four sacks of lime and poured two underneath the body and two above it. Then we nailed on the lid again and filled in the grave."

Two and a half months later, the *Santa Cruz* was ready to sail for Malacca. Antonio, anxious to carry the bones of his master back to India, pleaded with the captain of the ship. The captain sent his men to examine the condition of the bones. When they opened the coffin, instead of bones, they found the body "whole, fresh smelling, the flesh soft and succulent and the veins full of blood." Even the vestments seemed to have been unhurt by the lime. As proof to present to the captain, his men cut off a piece of flesh from near the left knee and found that the blood flowed freely. This was the first of many such indignities to which the saint's body was to be subjected.

The *Santa Cruz* sailed on February 17, 1553, arriving in Malacca on March 22. Here the body was taken off the ship and carried in procession to the church of Our Lady del Monte. Then a grave, as large as could be managed, was cut out of the rock near the high altar. The body was removed from the coffin. The grave, however, proved to be too small. So the body had to be pushed into it in such a way that the head was bent over the chest.

In August, a friend of Xavier, Joam Beira, arrived in Malacca and wished to see the body. He and a few others secretly had it exhumed. The linen cloth on the face had blood on it, they reported. There was damage to the nose, some bruises on the face and a wound on the left side made by a sharp stone. Otherwise, they said, Xavier looked as if he were in a sleep. They hid the body until a vessel could be found to take it to Goa, where it arrived on March 15, 1554.

The body lay in state at the college of St. Paul for four days so that the devout could come view, touch and kiss the feet. This was the first public exposition and the first "kissing." A lady, one Dona Isabel de Carom, eager to possess a relic of the saintly father, bit off a toe from the right foot and carried it off in her mouth. It was never recovered.

To confirm the miracle of the incorrupt body, the Portuguese viceroy had it examined by doctors. Dr. Cosmas de Saraiva wrote on his certificate, "I felt and pressed all the members of the body with my fingers, but paid special attention to the abdominal region and made certain that the intestines were in their natural position. There had been no embalming of any kind nor had any artificial preservative agents been used. I observed a wound in the left side near the heart and asked one of the Society who was with me to put his fingers into it. When he withdrew them, they were covered with blood. . . the limbs and other parts of the body were entire and clothed in their flesh. . . ."

Saint and city: a mutual withering

On November 3, 1614, the right arm of Xavier was severed, perhaps at the request of the general of the Jesuits, who was desirous of a relic. The greater part of the severed arm was sent to Rome to rest in the Church of the Gesù. The remainder was cut in two and sent to colleges in Malacca and Cochin. The shoulder was sent to Macao. There was, reportedly, a great loss of blood at that time and many Goans insist that it was this that caused the body to begin withering.

Xavier, along with Loyola, was canonized in 1622. His body was moved from St. Paul's to the church of Bom Jesus (not yet a basilica) and a special silver, gem-encrusted coffin was built for it.

The drying up of the saint's body coincided with the drying up of the Portuguese Eastern empire. The Dutch, British and French were beginning to threaten Portuguese trade routes. The golden city of Goa, struck by one epidemic after another and suffering from financial stresses, slowly went into a decline from which it never recovered. Those people who were not

In the cathedral, white-robed nuns and other worshipers hear the final Mass of the exposition.

hit by disease or monetary losses were threatened hourly by a dire Portuguese import, the Inquisition. Residents and traders began to flee from the city. Public and private buildings began falling into disrepair.

During this period the body of the saint was exposed once every year on the day of his feast, December 3. Of course, if a governor was sick or an enemy threatened Goa or the Queen of Portugal wanted the holy Father's biretta to put on her head at the time of her confinement, the coffin was opened briefly and then shut again.

In 1694, Joseph Bayard, a French Jesuit, saw the body and testified that it was still in good condition. On April 2, 1775, a royal letter forbade all viewing of the body. But in 1782, there was again an exposition, mainly to confirm to the public that the saint was still in Goa and had not been spirited away by the Jesuits, who were at that time being persecuted by the Portuguese regime.

The next public exposition did not take place until 1859. The British were ruling most of India by then. Goa was a ghost city already. The population had dropped to less than 2,000. The gems from the silver coffin had disappeared and had been replaced with glass. A silver railing around the tomb had been melted down by the Portuguese mint and one of lead had been substituted. The body had not decomposed, but the drying-out process had accelerated. The chief surgeon and physicians of Goa, who examined the body, reported that it had shrunk to about 4½ feet. One toe, which seemed to be on the verge of falling off, was tied up to the others with a silk thread. Many present at this examination were under the impression that the head was separated from the trunk, but on a closer look they found that this was not so.

Expositions continued to be held every ten years or so from 1890 to 1961 (this was the year India decided to "liberate" Goa) and again in 1964.

It was now January 5, 1975, and the last day of what may be the final exposition. The "kissing" had started even before dawn, at 5:30 A.M., and was to end at 9 A.M. There was a tremendous crush of people. More than 15,000 were said to have "kissed" the body in the early morning hours. The pilgrims were being hurried past the coffin. St. Francis still lay in the enclosed glass casket, which was about five and a half feet in length. His head rested on a cream silk pillow, decorated with pearls and a scarlet and gold trimming. Today the body—from the top of the skull to the tip of the feet (which are angled forward)—measures a little over five feet. This discrepancy with the measurements

At the end of the exposition, the saint's remains are carried in procession back to Bom Jesus.

taken a century ago has one possible explanation. The head, which in early photographs is shown bent forward on the chest, may eventually have detached itself from the trunk, for it now lies flat on the pillow. There may actually be empty spaces under the vestments. The priests in charge would not discuss the matter.

The face is covered with dry, uneven, parched skin. The nose is broken and has a hooked appearance. The teeth, except for a missing front incisor, are clearly visible. And there is a hole in the right cheek that was apparently caused in Malacca. There is only one arm, the left one. It is folded over the chest. The feet seem to be the main object of reverence. The left foot has three full and two partial toes. Some of the bones are exposed. The right foot has only the big toe. The bones of the right heel are exposed and wiring is visible that is probably holding them together.

At 9 A.M. the public "kissing" ended and the High Mass followed at 10 o'clock. Then the coffin was lifted by several priestly hands to be carried back to its final resting place. Fifty thousand people, holding yellow, red, blue, green and black umbrellas to shield themselves from the sun, lined the path. Nuns were carrying vases filled with asters, monks were carrying incense and clearing the way, policemen were holding the crowd back. And the deep-toned bells of the cathedral were ringing. The body was taken past the area where the three-story Palace of Inquisition once stood—the largest building in all of Goa. There wasn't a trace of it—only newly planted grass, pushing its way out of the earth. The procession moved on and, with the noise of the crowd still buzzing outside, the coffin was taken into the Basilica of Bom Jesus. The doors were shut to the public and St. Francis was placed in the cool reliquary to rest. Brother Prem Kumar, one of the organizers of the exposition, heaved a sigh of relief. "I hope I *never* become a saint," he said. "They bother you even after you are dead."

GREAT SALE
OF
HORSES, CATTLE,
NEGROES & OTHER
FARM STOCK
THIS DAY AT
PUBLIC AUCTION
THE SLAVE AUCTION

By David Bourdon

An intimate regard for everyday life made a homely art

John Rogers, 19th-century people's artist once almost a part of many good homes, is now rediscovered and eagerly collected

Coming to the Parson is typical of the storytelling content of much of Rogers' affectionate work.

For nearly three decades in the 19th century, John Rogers was a household name, renowned for his plaster statuettes which adorned middle-class parlors all over the country. His specialty was a type of storytelling sculpture, containing human figures, known as Rogers' Groups. In many ways he was the counterpart to Currier & Ives, the immensely successful New York firm of printmakers, who suffused most of the American print market with inexpensive lithographs. Like Currier & Ives, Rogers stressed mostly the happier aspects of American life in an attempt to make his work more appealing to the widest possible audience.

Rogers excelled at modeling domestic and rural scenes (young couples courting, old folks playing chess), all rendered in a naturalistic style that overlooked no homely detail. His special gift was for capturing the quintessential poses and expressions of specific types of people—soldiers, slaves, doctors, preachers, peddlers, grandmothers and country belles.

Rogers' subject matter sets him apart from most other American sculptors of his time. Moreover, he made his sculpture in a way that seems more appropriate to the 20th century: He mass-produced his work by "publishing" large editions in cheap plaster.

Rogers was a strong abolitionist. His *Slave Auction*, now a rare work, did not sell well at $5 a copy because it was considered too controversial.

Between 1860 and 1893 Americans bought about 80,000 Rogers' Groups at an average price of $14. The sculptor preferred "to put them at a price that no one who likes them need hesitate to buy." The Groups were ideal gifts for almost any occasion. One Group, called *Weighing the Baby,* was the inevitable choice for new parents. Another Group, *Coming to the Parson* (above), was so popular as a wedding gift that about 8,000 copies were sold, accounting for one-tenth of Rogers' total production.

Everything about John Rogers, the man, indicates he was the personification of old-time American virtue: honest, thrifty, hard-working and enterprising. He was in life what most men are only in their obituaries: a dutiful son, a dear brother and a loving father of seven children.

He attained maturity as an artist during a period that is not prized today for many of its esthetic inventions. It was an era in which artists did not feel they had to be innovative for innovation's sake, and so most painters and sculptors were quite content to make decorative objects that in no way jarred their audience. To most of them the concept of avant-garde art would have been as remote as Mt. McKinley. Rogers, who belonged to the mainstream of American society, wanted to please his public with works that expressed simple sentiments in a forthright way, frequently with a dash of humor, sometimes with a touch of pathos.

Rogers' Groups celebrate the simple pleasures and

Color photographs by Yale Joel

In 1864, at height of Civil War, *Wounded Scout* depicted escaped slave aiding Union casualty.

pastimes of 19th-century American life in a style that is his own.

Although his father made a decent salary at the railroad company in Salem, Massachusetts, where Rogers was born in 1829, he apparently could not afford to put young John through Harvard, where so many men of the Rogers family had studied. Instead, Rogers went to the English High School, which trained young men for a life in commerce. One of his teachers, however, taught him to draw, and that awakened his interest in art.

At 16 Rogers took a clerical job, which paid an annual wage of $50, in a Boston dry goods store. Then he took a better-paid position as a surveyor's assistant with the Boston Water Works.

In Boston, Rogers visited Horticultural Hall and paid 25 cents to see Hiram Powers' celebrated marble sculpture *The Greek Slave* (SMITHSONIAN, November 1972), then making a tour of several American cities. About a dozen years later he asserted that *The Greek Slave*'s fame was due entirely to her chains. "The chain showed that she was a slave and the whole story was told at once. There are plenty of figures as graceful as that and it is only the effect of the chain that has made it so popular." The remark is illuminating because it helps explain why Rogers, in his own work, placed so much importance on storytelling accessories.

In 1848, during a visit to a Boston friend, he was shown a clay figure that the friend had modeled. Rogers was inspired to do the same, so he bought some clay and set to work. "I was quite successful," Rogers recalled later. "I would have been glad to take this up as a business," he continued, "but my relatives thought it offered a poor support, and favored another offer which I had for a position in a machine shop."

The machine-shop job was with Amoskeag, the huge complex of bustling mills in Manchester, New Hampshire. Rogers spent about six years there.

When he was 28, Rogers left the mills. He found a job as master mechanic on the Hannibal and St. Joseph Rail Road, and in 1856 made the thousand-mile railroad journey from Boston to Hannibal, Missouri. The town seemed scarcely civilized. "Unless they import some Yankees," he declared, "I'm afraid they will never make much of a place of Hannibal."

Rogers lost his job during the money panic of 1857, when the railroad closed down its machine shop. He returned to Massachusetts with a renewed determination to become a sculptor. With his own savings, the financial backing of an aunt and uncle and the reluctant approval of his family, Rogers sailed for Paris in the fall of 1858 to acquire the technical training necessary to an aspiring sculptor.

David Bourdon, a former Associate Editor of SMITHSONIAN, *is now art critic for the* Village Voice.

Gamesmanship, as it was employed in an earlier time, furnished the gentle sculptor with innocent scene.

By April 1859, after less than a year in Paris and Rome, and unimpressed by what he saw, Rogers was back home in Roxbury. After five more months there, during which he was unable to find employment, he went job-hunting all the way to Chicago, where he finally found a job as a draftsman in the city surveyor's office. In Chicago, Rogers was invited by some women in his church to produce a statuette that could be raffled off at a charity bazaar. He modeled a clay sculpture portraying two men playing checkers. His checker players attracted considerable attention and were raffled off for the whopping sum of $75. The most encouraging thing about all this was that two or three disappointed ticket-holders inquired about buying other pieces of sculpture. The success and attention were enough to give Rogers heady visions of fulfillment, fame and profit.

He immediately went to work on two more subjects, one of which was a slave auction.

Of *The Auctioneer,* Rogers wrote: "I have rather idealized and made such a wicked face that Old Nick himself might be proud of it—two little quirks of hair give some impression of *horns.* The woman will be more nearly white and she and the children will come

in very gracefully. I am entirely satisfied to stake my reputation on it and imagine the present excitement on the subject will give it great popularity."

He intended to produce the sculptured group in a large edition to assure profit and popularity. "My plan is to get subscribers for it here and then take it to New York and get it cast. I shall then send copies to all the large cities and dispose of them at fair prices so as to become known and have them popular."

Declaring that he was going to make a "perfect balloon" of himself, the 30-year-old ex-draftsman set off for New York, where "promising artists," then as now, are sometimes rewarded.

From the very start of his career in New York, Rogers displayed real flair for imaginative merchandising. To make his *Slave Auction* (p. 50) more appealing, he hired a black man to go about on the streets, hawking the group. Rogers' black agent had scarcely started on his rounds when he had the good fortune to cross the path of an important abolitionist, Lewis Tappan, who not only bought a *Slave Auction* on the spot, but also gave the startled vendor a list of prospects.

Despite considerable enthusiasm in abolitionist circles, *Slave Auction* did not prove to be very popular. It "tells such a strong story," Rogers lamented, that no store would stock it "for fear of offending their Southern customers." Only 30 or so copies were sold, and surviving casts are rare today.

His next subject, a new version of *Checker Players*, was calculated to offend no one. A fancy goods store on Broadway stocked it and put a retail price of $5 on it. The store people expressed interest in selling more works by Rogers, but tried to talk him out of making realistic genre groups in "cheap" materials. Rogers insisted that his works were "not intended for rich people's parlors, but for the more common houses in the country. . . . As I want them *popular*, they *must be put low* or else nobody but the rich will buy them and they would not want them in their parlors. . . . Large sales and small profits is the motto I must stick to."

The Civil War provided Rogers with a whole new range of topical subjects and stimulated his imagination to make some of his finest work. One of his most eloquent and powerful subjects, *Wounded Scout* (p. 52) of 1864, shows an escaped slave helping an injured Union scout through a swamp.

By 1864, when he was 35 years old, John Rogers had reason to be satisfied with what he had accomplished since turning professional five years earlier. His work was increasingly sought after by the public, he was, on occasion, a critical success and he married happily.

James Jackson Jarves, probably the most discerning art critic of the time, was definitely in favor of Rogers' Groups: "Although diminutive, they possess real elements of greatness. In their execution, there is no littleness, artifice or affectation. . . . His is not a high art, but it is genuine art of a high naturalistic order, based on true feeling and a right appreciation of humanity. It is healthful work, and endears itself by its mute speech to all classes."

The first group that Rogers designed after his marriage in 1865 to Harriet Moore Francis, a young New

A Southern woman reluctantly pledging allegiance to the Union—one of Rogers' most popular pieces.

York music teacher, was inspired by a story told to him by his wife's uncle. It portrays a Southern woman, reluctantly pledging allegiance to the Union in order to get food for herself and her son. Having made his initial sketch for *Taking the Oath* (opposite) in September, Rogers worked hurriedly to have the group ready for the Christmas holidays. He sold more than 300 copies that season, and *Taking the Oath* retained its popularity for many years afterward.

Between 1859 and 1893 Rogers produced a total of about 90 groups, in addition to numerous portrait busts, garden figures, decorative vases and flower boxes. He frequently pressed his wife and children into service as models. His wife and two-year-old son David Francis posed for the mother and child in *The Sitter,* one of a pair of statuettes intended to be placed at opposite ends of a mantlepiece or table. (The second part shows *The Photographer,* adjusting his camera with one hand and holding the articulated stick figure of a soldier in the other.) Two more Rogers children, Katherine and Charles, posed for the enthralled children being entertained by the hurdy-gurdy player in *School Days* (left). Katherine also posed for the dozing assistant with the tambourine in *Traveling Magician* (above). The magician himself may be a self-portrait, since he has, in addition to the requisite arched eyebrows and Mephistophelian curls, an aquiline nose that was unmistakably similar to Rogers' own.

The hurdy-gurdy man, a monkey and entranced children constitute, what else?, *School Days.*

Believed to be a self-portrait, *Traveling Magician* models Rogers' arched eyebrows, aquiline nose.

Throughout his career Rogers proved himself to be a remarkably resourceful salesman. He advertised widely, of course, and often exchanged his groups for free advertising space in newspapers and magazines. He distributed illustrated catalogs of his wares. He also marketed or licensed photographic reproductions of the groups in the form of album photographs, stereopticon views and magic lantern slides. His thriving enterprise reached its zenith in the mid-1880s, during which his luxurious Union Square showroom became one of the city's most pleasant attractions.

Suddenly, in the late 1880s, Rogers' business dropped off sharply. The decline was partly due to a plunge in the economy which eventually became the financial panic of 1893. But the chief reason for the decline was a change in the public's taste. Rogers' Groups suddenly appeared naive and unsophisticated to the younger, more urbane generation, who ushered

in what became known as the gilded age. Along with wax flowers, haircloth furniture and other Victorian-type furnishings, Rogers' Groups were banished from fashionable parlors.

Coinciding with his waning popularity, Rogers' health began to fail in about 1891. The ailment started out in his right hand, as a slight tremor that did not respond to treatment. Eventually the tremor disabled him to such an extent that he was no longer able to model any sculpture. In 1893 he sold all his rights in the groups to the foreman of his plaster shop, and the business folded soon after. By the time Rogers retired to New Canaan, Connecticut, a couple of years later, his body was nearly doubled over. Almost mercifully, bronchial pneumonia set in and served as the coup de grace in July 1904.

Rogers' reputation was all but totally eclipsed for several decades. But a new audience for his work began to grow and, in 1967, the sculptor was made intellectually respectable by the publication of David H. Wallace's *John Rogers, The People's Sculptor* (Wesleyan University Press), a comprehensive study of Rogers that is both scholarly and readable.

One of John Rogers' heirs, a 29-year-old great-grandson who is also named John Rogers, spearheads the current revival. The present-day John Rogers, who works as a new products analyst with U.S. Plywood, inherited a lot of family memorabilia. Since he was living in New Canaan, he decided he'd personally restore his ancestor's old studio, which is now maintained by the New Canaan Historical Society. Beginning in the fall of 1969, he spent most of his spare time completely refurbishing the place. While working in the studio in 1970, he was approached by two enthusiasts who persuaded him to head up a group of Rogers' Groups collectors.

Members own 1,800 of the 2,500 surviving Rogers' Groups that have been accounted for. Rogers' Groups are still highly collectible, though they turn up on the market ever less frequently, and seldom in mint

Live Rogers group shows the father of seven, with two yet to come, when photo was taken in 1876.

Namesake and great-grandson, John Rogers, speaks at a current meeting of collectors, The Rogers Group.

condition. The most common Rogers' Groups sell in the $300 to $700 range, but scarce pieces will bring $1,000 and up. More than 40 copies each are known to exist of *Taking the Oath* and *Coming to the Parson,* while surviving casts of *Slave Auction* and *Checker Players* are exceedingly rare. The groups are plentiful in a great many museums, including the Smithsonian's National Collection of Fine Arts, which possesses ten. A copy of *Neighboring Pews* occupies a prominent position in the Lincoln Sitting Room of the White House (though it was not owned by Lincoln). The best and most complete public collection of Rogers' Groups, including 38 of the bronze master models, is in the New York Historical Society.

For a few collectors, the Rogers' Groups are not enough; they have to collect anything associated with Rogers, from lantern slides to personal mementos. For instance, Herman and Eleanor Deutsch of East Meadow, Long Island, own 78 groups (76 in plaster, two in bronze). They also possess plaster life masks, made by Rogers of his own face and those of his parents. They treasure their 14 glass slides, all showing Rogers' Groups, which they acquired along with their century-old magic lantern. In addition, they keep a fancy stereopticon with vintage views of Rogers' Groups.

Paul and Meta Bleier of Valley Stream, also on Long Island, are just seven pieces short of a complete collection of Rogers' Groups. They have 78 plasters and one bronze. The walls of their living and dining rooms are literally covered with Rogers' Groups. They have written a useful handbook *John Rogers' Groups of Statuary, A Pictorial & Annotated Guide for the Collector,* which they published themselves in 1971.

Nostalgia plays a part in the John Rogers revival. Still, his work speaks more clearly of the American experience of his time than that of his contemporaries who were part of the academic mainstream.

Rogers is a unique figure in the history of American sculpture. He might be said to comprise entirely by himself, a "one-man group."

It's time you drove one of the ten best cars in the world.

In every field, the "ten best" list is an honorable, if subjective salute to excellence.

Whenever automotive experts rank the ten best cars in the world, the name Mercedes-Benz is always prominent.

And that may make your selection among the ten models we offer just a little complicated. But very, very rewarding.

Germany was the birthplace of the automobile. (Daimler-Benz invented it in 1886.) But America is its home. And so of the 27 different models Mercedes-Benz manufactures, we offer only ten to the United States.

Individually, each offers you very specific advantages. But there is a host of uncommon things that are common to them all. Here are a few examples.

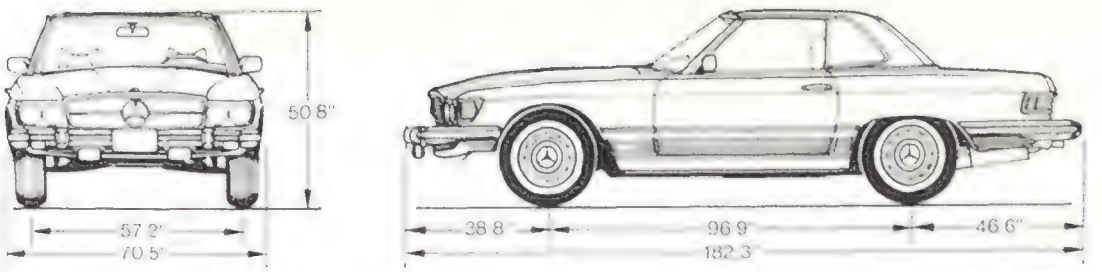
The engineering advantage

Mercedes-Benz introduced the first independent wheel suspension in 1931, the world's first Diesel passenger car in 1936 and, in 1951, patented the rigid passenger cell/collapsible front and rear zone construction now found on safety vehicles. In 1961, front disc brakes were introduced into standard production. In 1968, *every* Mercedes-Benz had disc brakes on all four wheels.

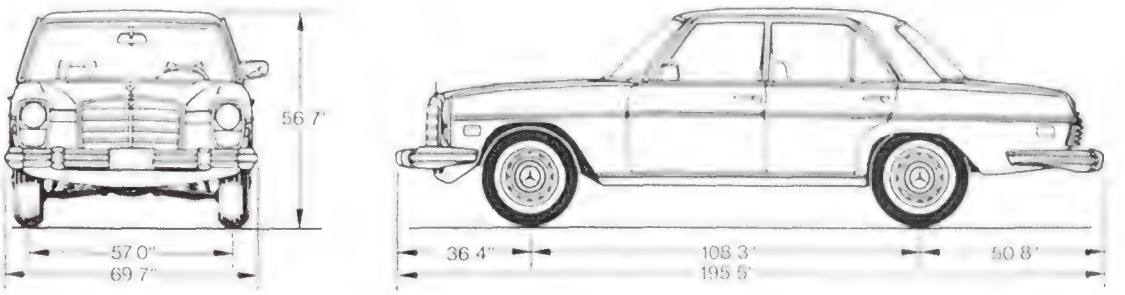
Engine technology has always been a Mercedes-Benz forte. To America, Mercedes-Benz offers a sophisticated, overhead camshaft four-cylinder gasoline engine...a smooth double-overhead cam six-cylinder with compound carburetor ...and an electronically fuel-injected, overhead camshaft V-8 engine that uses only the *exact* amount of gasoline required.

Our Diesels offer a separate and uniquely satisfying experience. Our latest Diesel, the 300D, is a classic of Mercedes-Benz engineering. It establishes a whole new category of Diesel—a whole new category of automobile.

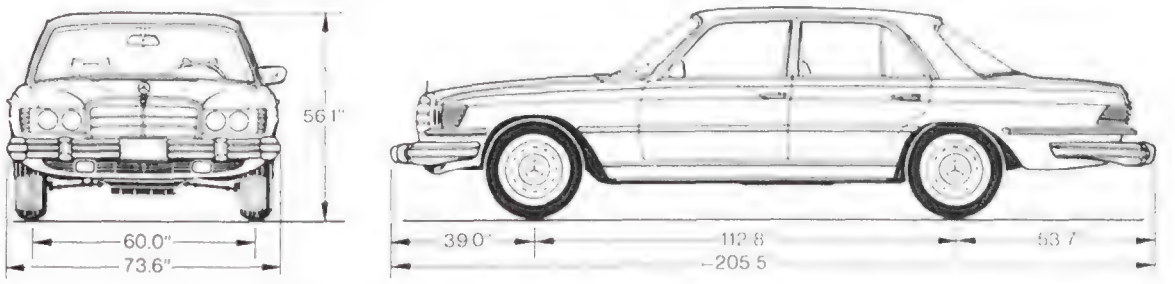
It is the world's most advanced Diesel passenger car. It is so luxurious that it banishes, once and for all, the image of the Diesel as a workhorse. Diesel fans will find its overall performance a stunning surprise—yet the EPA reports that it will deliver up to 24 mpg in town and 31 mpg on the highway. And it burns fuel that is readily available and usually cheaper than gasoline.



Mercedes-Benz luxury sports cars. Above, 2-seat 450SL. The 4-place 450SLC is 14 inches longer.



World's most copied sedans. Dimensions similar for 230, 240D, 280 Sedan and Coupe, 300D.



Mercedes-Benz 450 Series. 450SE Sedan and 280S, above; 450SEL is four inches longer.

Safety first

Every Mercedes-Benz fairly bristles with sophisticated safety devices, systems and elements. You may find some of them in other makes. But Mercedes-Benz feels that any car built for modern driving conditions should have them all.

Resale: The ultimate test of value

Resale value stands apart as a measurement of a car's worth. Many consider it the ultimate test.

Here, again, Mercedes-Benz performance has been consistently outstanding. Put most simply, the fact is this: Mercedes-Benz—and only Mercedes-Benz—has the best resale value of any make of car sold in America. Any one.

It's time you drove one of the ten best cars in the world.

A Mercedes-Benz.

Mercedes-Benz

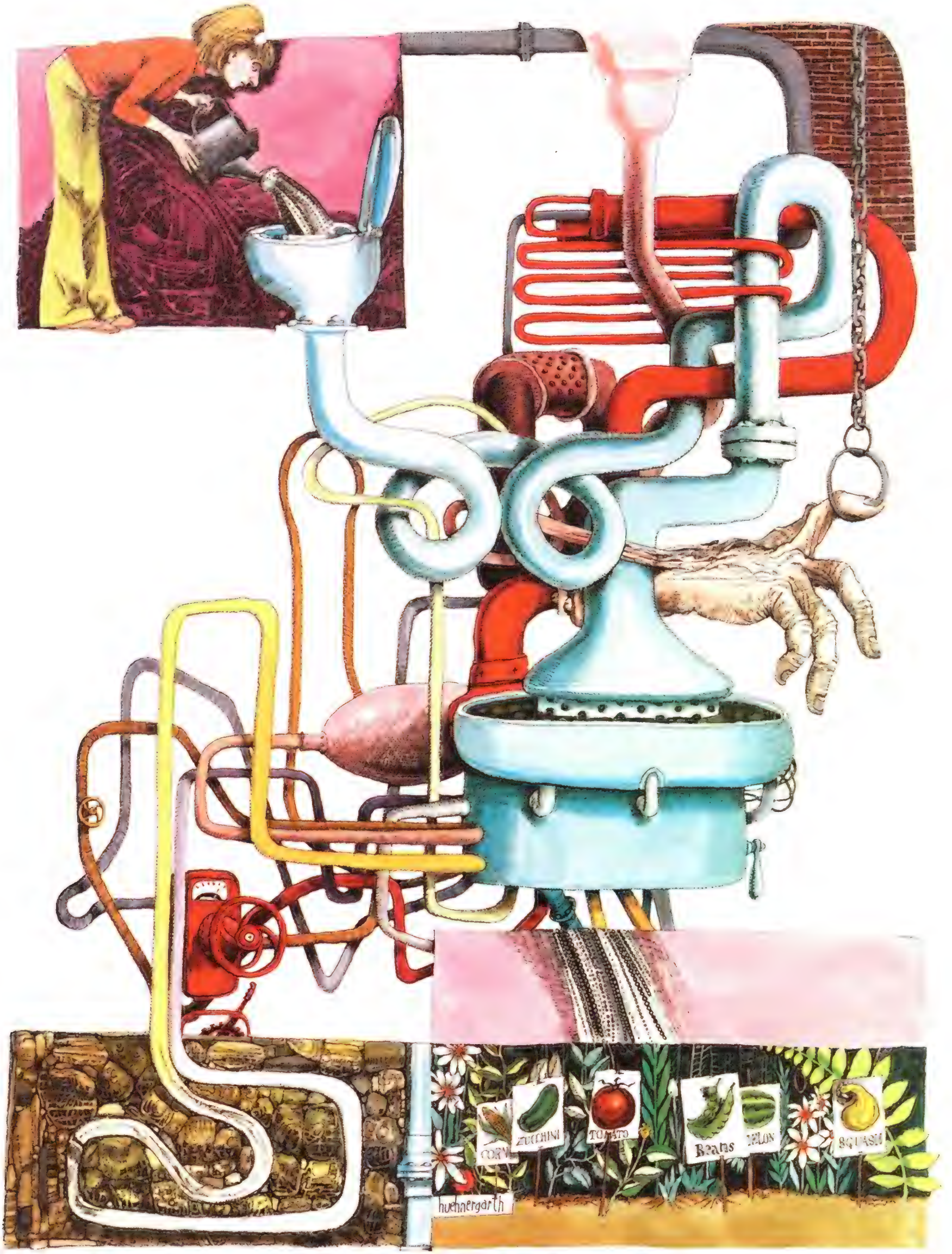
Engineered like no other car in the world.

Mercedes-Benz Technical Specifications

MODEL	ENGINE	DISPLACEMENT (CU. IN.)	WHEELBASE (IN.)	OVERALL LENGTH (IN.)	CURB WEIGHT (LBS.)	PRICE*
240D (Sedan)	4 cyl. ohc (fuel injected)	146.7	108.3	195.5	3205	$9,811
300D (Sedan)	5 cyl. ohc (fuel injected)	183.4	108.3	195.5	3450	$12,194
230 (Sedan)	4 cyl. ohc	140.8	108.3	195.5	3230	$9,684
280 (Sedan)	6 cyl. dohc	167.6	108.3	195.5	3560	$12,756
280C (Coupe)	6 cyl. dohc	167.6	108.3	195.5	3570	$13,520
280S (Sedan)	6 cyl. dohc	167.6	112.8	205.5	3920	$15,057
450SE (Sedan)	V-8 ohc (fuel injected)	275.8	112.8	205.5	4100	$18,333
450SEL (Sedan)	V-8 ohc (fuel injected)	275.8	116.5	209.4	4140	$19,775
450SL (Sports)	V-8 ohc (fuel injected)	275.8	96.9	182.3	3780	$17,653
450SLC (Sports Coupe)	V-8 ohc (fuel injected)	275.8	111.0	196.4	3820	$22,053

*East and Gulf Coast P.O.E. West Coast higher. *Exclude* State, Local taxes, transportation. *Include* suggested Dealer Pre-Delivery charges Subject to change without notice.

©Mercedes-Benz, 1975



There are ways—some less complex than above—
to design toilets that serve more than one purpose.

By Sam Love

An idea in need of rethinking: the flush toilet

Makers used to decorate chamber pots with images of archenemies. In this case, target is Napoleon.

Our present system is a major contributor to environmental decay and a waste of resources, but new ideas are proliferating

The Reverend Henry Moule's hellfire and brimstone sermons failed to make much of a mark on history, but his tinkering will never be forgotten in the annals of human sanitation. His most successful invention was the earth closet. Constructed by him in 1860, it consisted of nothing more than a wooden seat over a bucket and a hopper filled with dry earth, charcoal or ashes. The user simply pulled a handle to release a layer of earth from the hopper into the bucket. The container could be emptied at intervals.

Mr. Moule's original earth closet is a rather austere piece of household furniture, but later innovators loaded it with accessories. For example, a device could be added that released the earth each time a user rose from the seat. But the automatic earth release met with some opposition: "In sick rooms," according to one account, "this method of distribution of earth may be found objectionable, as more or less vibration follows the rising, and this is apt to disturb the nerves of a patient."

While sanitary historians may recognize Henry Moule's contribution, he is no longer a household word. Certainly he is not as well known as Thomas Crapper, the father of the flush toilet. In fact, while folk history is good to him, I am convinced he is a myth created by British author Wallace Reyburn, who wrote an amusing biography of him in 1969 entitled *Flushed with Pride*. Although the book and the history seem to be a complete figment of the author's imagination, many libraries, including the Library of Congress, file their bibliographical cards for the book as if it were a serious historical treatise on the origin of the water closet.

Who actually invented the water closet is a mystery; its origins go far back in history. One of the earliest indoor bathrooms has been found by archaeologists on Crete. According to the bathroom history *Clean and Decent* by Lawrence Wright, the great palace of King Minos at Knossos included a water-supply system of terra-cotta pipes that some have judged superior to modern parallel pipes. One of the Knossos latrines appears to have sported a wooden seat and may have worked much like a modern flush toilet. Cities in the Indus Valley between 2500 and 1500 B.C. also had indoor bathrooms flushed with water. The waste was carried to street drains via brick-lined pits similar to modern septic tanks. Except for the briefly used water closet of Elizabethan times, such engineering did not appear in England until the middle of the 18th century.

Generally, the 18th and 19th centuries in Europe were dominated by the pan closet or the jerry pot. By 1800 many were elaborate, even to the extent of placing portraits of archenemies (Napoleon was a big hit in England) in the target area. After use, the pots were either emptied or concealed in commodes.

At first the contents of the urban jerry pots were collected by nearby farmers who were delighted to get nitrogen-rich organic fertilizer. But as London and other cities grew, the journey became uneconomical

A coordinator of Earth Day in 1970 and formerly the editor of Environmental Action *and a book* Earth Tool Kit, *Sam Love is an environmental consultant.*

Illustrations by John Huehnergarth

Future archaeologists might well misinterpret today's plumbing as a centralized food-distribution system.

and the waste was generally dumped in larger communal cesspits or in the nearest river. Today's modern sanitary system, with its maze of underground pipes, pumps and treatment techniques, is a direct descendant of the communal and private cesspits and open sewers which emptied into rivers. For centuries, water as a waste-removal vehicle functioned adequately from the urban resident's standpoint. Ecologically, the price may have been high, but urban users found it convenient because it allowed them to simply flush wastes and forget them. Only those people living downstream might be forced to question the wisdom of such a system.

Now, though, as cities grow larger and rivers become more saturated, increasing numbers of people are finding themselves living downstream. In area after area, urban growth is creating major water problems which are becoming front-page news stories. For example, Virginia's Fairfax County, a suburb of Washington, has been forced to declare a moratorium throughout most of the county on residential and commercial sewer applications.

A major villain in each case is the flush toilet. Of all home water users, the flush toilet is the biggest single consumer: The average North American family annually uses 35,200 gallons for toilet flushing.

In addition to water costs, the economic costs of the flush toilet and centralized waste treatment are rising. Currently, the investment in the utilities infrastructure in Western countries is around $500-$600 per person. This contrasts sharply with a country such as Tanzania, which in 1969 could spend only $8 per urban inhabitant. Thus, because of costs, the "modern" sanitary system, which Westerners now take for granted, is out of reach to most of the world's population. Reportedly, 70 percent of the human race does not even have piped water. The World Health Organization estimated in 1972 that only 8 percent of urban families in developing countries of Asia and Africa had access to a sanitary sewage system.

Moreover, energy costs of large centralized sewage-treatment systems are staggering. While the professional literature is slim in this area, one estimate is that, at full capacity, a 309 million-gallons-a-day waste-treatment system, such as that being built now for the Washington, D.C., area, will consume as much as 900,000 kilowatt hours of electricity, 500 tons of chemicals and 45,000 gallons of fuel oil daily. Some environmental groups, however, consider this estimate to be a low one and point out that, in any case, burning the sewage to produce 400 dry tons of sludge each day will create a major air pollution problem. Thus, even if the water required for the flush-toilet system were available in abundance, the growing scarcity of the other resources that support such a system is beginning to impose limits.

Already the flush-toilet, central waste-treatment system is in trouble. One response from toilet manufacturers was to begin marketing a "water-saver closet," which uses one-third less water than many older models now in use. Although major manufacturers have had water savers available for several years, an industry source says that these toilets account for no more than five percent of those installed today. He attributes the lack of sales to public apathy concerning

One new toilet design, which freezes wastes for later removal, had disadvantages to be worked out.

water problems and the slightly higher price of the water savers.

Even with water savers, however, many of the flush toilet's basic problems still exist, so some people in the field are actively pushing alternative methods of human waste disposal both on a public and a private level. Dr. John R. Sheaffer, a resource manager with the Chicago firm of Bauer, Sheaffer and Lear, contends that one possibility is simply to use the nutrient-rich sewage, after deodorizing and disinfecting it, to irrigate agricultural lands and let the water filter through the soil and into an "under drainage" system where purity can be monitored. The soil naturally cleanses the liquid wastes, except during freezing winter months, when the sewage can be stored for spraying on fields later.

Dr. Sheaffer's system has been tried in communities and found to work successfully. Bakersfield, California, and Abilene, Texas, are among larger cities that rely on land treatment of sewage. These systems use far less energy and chemicals than the advanced waste-treatment system, which tries to restore the waste water to its original quality. Michigan's Muskegon County recently put into operation a large (28-million-gallons-a-day) system using Dr. Sheaffer's "living filter" principle.

Among its advantages is the fact that the land treatment system lets man work with nature, not against it. But its critics are quick to point out that land treatment requires large areas of land, a commodity that is also in short supply around large metropolitan areas. There is also concern among health officials that such systems might not screen out potentially harmful viruses, bacteria and industrial chemicals. Dr. Sheaffer's answer is that the water in projects he has worked with has always met pure-water specifications. In addition, the drainage system prevents salt build-up and waterlogging of soil.

For all its promise in cities that already have the plumbing, access to agricultural land and abundant water, land-treatment schemes fall short of meeting criticism that challenges the centralized waste-treatment approach with all of its piping, rights-of-way, energy use, water waste and control regulations.

One critic of the centralized flush-it-and-pass-it-on system, Berkeley architect Sim Van der Ryn, has imagined how future archaeologists, sifting through the material remains of our present culture hundreds of years from now, will interpret the curiously shaped ceramic bowl in each house, hooked up through miles of pipe to a central factory of tanks, stirrers, cookers and ponds, emptying into a river, lake or ocean. According to Van der Ryn their report might read:

> By early in the twentieth century, urban earthlings had devised a highly ingenious food production system whereby algae were cultivated in large centralized farms and piped directly into a ceramic food receptacle in each home.

A search for alternatives

The difficult challenge is to find a workable alternative. In a publication entitled "Stop the Five Gallon Flush!" the Minimum Cost Housing Group at McGill University's School of Architecture in Montreal examined systems from around the world that are designed for home use, and catalogued 52 of them from 11 countries. In their evaluation, the group steered clear of thinking of the modern flush toilet as "advanced," compared to a technology such as the pit latrine. As the researchers point out, "under certain conditions the latter is ecologically sound, cheap and quite safe."

What they found is a tribute to human ingenuity. For example, you can purchase a toilet from a Norwegian company for about $400 which uses an attached freezer to solidify the wastes so that there is no smell and no bacterial action. The toilet does require electricity, but no water or chemicals. The wastes are stored in a biodegradable plastic bag which can later be composted. At first the toilet suffered from a slight technological problem: The refrigerated air not only froze the waste, but it also chilled the seat, in turn

chilling consumer interest. Now, however, freeze toilets stream warm air from the refrigeration unit's compressor over the seat to keep it warm.

If the freeze toilet doesn't light consumer fires, there are a variety of toilets that go to the other extreme; they incinerate the wastes with natural gas and/or electric heat. A Swedish design, the Pactor 101, utilizes the versatility of plastic to collect waste in a tube which is sealed by heat after each use to form a link in a large plastic "sausage." The chain is then stored in a removable plastic bag until it is discarded, along with other nonbiodegradable industrial age byproducts, somewhere in the great "away."

The World Health Organization, with headquarters in Geneva, has another, more ecological, approach: It offers plans for constructing a small-scale plant that can recover methane gas from human and animal wastes. The gas can be used for cooking, heating or for power. Critical to the operation of such a unit is an abundance of manure so that animals, which produce larger quantities of manure than people, are essential to this approach. Horses and cows produce about 10 to 16 tons of waste per year, whereas humans add only 30 to 60 pounds per capita in the same time period. What humans lack in quantity, they make up in quality; our waste is rich in nitrogen and phosphorous, needed for biological digestion and methane production from materials such as cellulose, which have a high carbon content. The World Health Organization points out that a ton of manure can yield 65 to 90 cubic yards of gas per digestion cycle, depending upon the temperature. A cycle can be from 1 to 12 months. The initial costs of such systems are comparatively high, but operation and maintenance are insignificant.

For those without the necessary animals to support a methane toilet, the Swedes, who are undoubtedly emerging as the leaders in the world's alternative-toilet development race, have come up with another design which uses virtually nothing as a transport medium, thus eliminating the problems created by moving wastes with large volumes of water. This toilet, manufactured by Sweden's Electrolux Company, utilizes a vacuum pipe to move wastes. Invented in the 1950s, it has been applied successfully in a number of different scales of operation, including railroad cars, a camp site with 83 toilets and a small community of 273 homes. The advantages of the system are that it requires only a small amount of water, less waste is created which has to be stored and removed, and smaller pipes can be used. Although cheaper to operate than a conventional system, its initial costs are high: A one-toilet installation costs about $1,200.

Other countries have also developed interesting designs which rely upon water, utilizing it much more efficiently. A Japanese model, made by Toto Ltd., takes the bold step of mating the standard washbasin with the standard toilet. The result is a freestanding unit which uses water from the sink, mounted on the top of the toilet tank, for flushing. The saving on water from this integration is around 25 percent. In addi-

A freestanding Japanese model saves water by mating a standard washbasin with a standard water closet.

tion, there are also savings in cost and space, since the two bathroom fixtures occupy the space normally required by one. The Minimum Cost Housing Group at McGill University has modified this design and cast it in sulfur concrete, an extremely cheap material, so that these toilets can be made for about $50. An English modification, marketed by Ideal-Standard Ltd. for less than $20 each, allows a person to selectively flush the toilet. The tank releases either one or two gallons depending upon the requirements. Uruguay has produced a flexible toilet tank which functions on the principle of the punching bag. It has virtually no moving parts and is activated when the user depresses a plastic cistern by hand so that water can flow into the downpipe. This gives the user control over the amount of water released.

Even these ingenious approaches to waste removal have their drawbacks, because they are either too expensive for much of the world's population, or use too much energy or water. But after a careful search for toilet alternatives, another approach to the waste problem is beginning to interest increasing numbers of people—composting.

The principle of using human waste or night soil as fertilizer has been known and utilized in some cultures for centuries, although it has been little used in the West. In the late 1930s Rikard Lindstrom, a Swedish art teacher, began experimenting with a toilet that would compost human waste for use on his garden. He was also motivated to work on the system out of concern for the sewage contamination of the Baltic bay near his home. The product of his work is the Clivus Multrum, a toilet which successfully composts wastes without water, electricity or chemicals. The name comes from *clivus,* which is Latin for "inclining," and *multrum,* which is Swedish for "composting room."

What human waste lacks in quantity, compared to cows, it makes up in quality, being rich in nitrogen.

How the Clivus works

The device itself is a fiber glass container about nine feet long, three feet wide and five feet high. It contains three compartments, a top one for human waste, a middle one for vegetable scraps and other organic refuse, and a lower one which holds the finished compost. A vent pipe at the top of the composting chamber allows odors and gas to exhaust out the top of the house. The early Clivuses had to be installed in basements directly underneath the bathroom and garbage chutes, but a later model utilizes a screw transport to move wastes so that the toilets and composting chamber can be mounted at the same level. It also allows multiple toilets to be connected to the same Clivus. The Clivus is odorless, thanks to a unique design which utilizes the heat created by composting organic matter. The heated air in the chamber rises through the vent pipe, thereby creating a downdraft at the toilet stool and garbage chute. It is strong enough to pull the flame of a match downward when held over the toilet.

To get the composting process started, the bottom of the container must be lined with organic material such as peat, garden soil and grass clippings. After the initial loading the process continues indefinitely, producing several buckets of humus per year per person. The newly formed rich soil in the bottom chamber can be removed about once a year, after a startup period of about two years.

In Sweden and Norway more than a thousand Clivuses are in operation, and it has been given the blessings of the Swedish Ministry of Health. Some communities in Sweden even give Clivus owners a tax rebate because they reduce the cost of municipal services such as sewage and garbage collection. Extensive tests by Swedish health authorities have found that no harmful bacteria, viruses or parasites can withstand the year or so of heat and bacterial action produced by the composting process. Although tests indicate that the end product of the Clivus process is perfectly safe for garden use, *Organic Gardening and Farming* magazine recommends, as an extra safety precaution, that it not be used on edible root crops. It can be used on other plants.

The composting toilet is getting widespread use in Scandinavia, but only a few have been sold in the United States. A firm in Cambridge, Massachusetts, Clivus Multrum USA, Inc., has acquired a franchise

for the system and is now producing them in a plant in Maine. Although costs are still high at about $1,500 per installation, this is expected to come down with mass production. Experiments are also under way to fabricate the toilet out of cheaper materials.

The state of Maine has recently rewritten its plumbing code to permit the installation of composting toilets. Some health authorities in other states are also allowing them to be installed experimentally.

Established and backed by Abby Rockefeller, the company she has created is staffed by people who promote the toilet with all the fervor that her ancestors used to sell Americans on Standard Oil. "I look at it this way," says Bob Pacheco, the installations director who, if possible, personally visits the site of each installation. "I don't like the idea of turning the oceans and rivers into open sewers. Every Clivus I install in a family dwelling could mean 40,000 gallons less sewage for Boston harbor or another body of water."

The Clivus can handle all human waste, including urine, plus table scraps and other organic material such as the contents of the vacuum cleaner bag, but it cannot handle too much water. As a result the "gray water" produced by washing dishes or hands must go into a conventional system. But Miss Rockefeller thinks she can solve that problem. Her next project is a greenhouse adjacent to her conventional frame house in Cambridge that will utilize waste water to grow plants. She has installed a Clivus in her house and reports no trouble after more than a year of operation. To get the composting process going, she dumped into her Clivus all the organic wastes from a neighborhood restaurant. She has also added earthworms and other creatures to see if they can tolerate the heat and speed of the decomposition process.

The initial costs may appear prohibitively expensive, yet it is already competitive in areas where steep sewer hookup fees are required for conventional toilets. As mass production and alternative materials bring the Clivus' price down, it will be even more attractive. In addition, a group that Sim Van der Ryn works with in California, the Farallones Institute, is experimenting with ways people may build their own composting toilet. Their initial model can be built for less than $100 out of concrete blocks.

Some may view the composting toilet as simply a throwback to the outhouses of the past and reject it, but that would be shortsighted. Its time appears near at hand, as "No swimming, fishing or boating" signs pop up with increasing frequency on the banks of our rivers. With no connections to external networks, no moving mechanical parts, and its useful by-product, the composting toilet is a beautifully simple piece of technology of which a society could be proud.

Many benefits would accrue if we used our heads instead of using our rivers as the great "away."

Seven vacations for the price of one.

When you vacation in beautiful Nova Scotia, you get more vacation then you bargained for.

Of course, you get all the things we're famous for.

Like our incredibly l-o-n-g coastline, all the friendly people you can shake hands with, and a history lesson on practically every corner.

But you also get a totally new kind of holiday. It's like seven vacations in one.

To begin with, six of them take you through our countryside, because they're thoughtfully-planned, carefully marked holiday trails. That makes for great drives, interesting side trips and endless exploring.

One day you'll roam the craggy mountainous hills of Cape Breton. The next day you're on the beach near Peggy's Cove. With lots of time left to see the classic churches on the Evangeline Trail, and do a Scottish fling in Antigonish. Not to forget the golf and salt water sport fishing that are waiting at our secluded resort hotels.

Whew.

Then comes the seventh part of your vacation. In our famous port cities, Halifax and Dartmouth.

Seafood that's out-of-this-world, at prices that aren't. Swinging discos that swing until very very late. Handsome handicrafts. Luxurious indoor-pooled hotels.

Why not send for your free Nova Scotia holiday kit right now.

Lots of places can offer you a great vacation.

How many can offer you seven?

NOVA SCOTIA

Couldn't you use a little now?

For more information about this beautiful part of Atlantic Canada, write to one of our Nova Scotia Information Offices: 630 Fifth Avenue, Suite 3115, New York, N.Y. 10020 Area Code 212-581-2420/616 Forest Avenue, Portland, Maine 04101, Call 772-6131, (other parts of New England call toll free 800-341-6709) P.O. Box 130, Halifax, Nova Scotia. B3J 2M7.

Tucker walks over the remains of a passenger ship
which has yielded him 40 tons of brass, copper and lead.

By Peter Stackpole

Treasure-diving Teddy Tucker still builds a legend

He scours the wreck-strewn reefs of Bermuda with an unfailing nose for spotting salvage, then turns amphibian to get his loot topside

Wearing an octopus like a rakish hat, Tucker gets an unaccustomed glimpse of life on the surface.

When Queen Elizabeth visited Bermuda last February, plans were laid to show her the island's most cherished treasure, a gold cross set with emeralds. It is considered the most valuable single piece of jewelry ever found in the ocean. A half-hour before Her Majesty was to view it, the object was discovered to be a clever plastic imitation. The real jeweled cross (p. 70) had been stolen.

The subsequent frantic investigation proved that the cross could not have been switched more than a month before, for every month the one Bermudian who couldn't be fooled by the fake would check on the object. He is the island's famed treasure hunter, Teddy Tucker, and he found the cross in the first place.

Edward Bolton Tucker's almost daily involvement with the ocean could be hereditary, because his lineage dates back to the third governor of the colony, Daniel Tucker, in the early 1600s. Throughout Bermuda's early history the island's survival depended greatly upon occasional salvage from those ships of all flags which unknowingly came in too close and were driven on the reefs. *Sea Venture,* wrecked in 1609 on Bermuda's eastern reefs, inspired Shakespeare's *The Tempest* and started the founding of the colony.

As a 14-year-old schoolboy, living with his mother and architect father in lower Hamilton harbor, Tucker began his interest in salvage. It probably started soon after the Spanish Republican ship *Cristobal Colón* went on the reefs northwest of the island in 1936 while enroute from Cadiz to Veracruz. The crew was saved, but the ship sat upright on the reef for months, even causing another ship to go aground when it came in too close, believing her to be afloat.

Despite the watchful eye of the local authorities, Bermudians in droves visited *Cristobal Colón* after she filled with water. They took off furniture, table service, china, woodwork ornaments and an unknown amount of cargo. Tucker's family gained a fine tile-top table from her, but the prize loot for Teddy and a school chum was two cases of Spanish wine. They sold some and polished off the rest, floating around Hamilton harbor in a rowboat until they passed out.

During World War II, Tucker enlisted in the Royal Navy, learned hard-hat diving and had a mine sweeper blasted from under him in the Orient. He was arrested after a bar fight in Saigon and was sent to a French jail from which he escaped. After hiding all night in a lily pond in the public square, he stowed away on a ship bound for Hong Kong. After a lengthy AWOL during which he visited parts of the Orient, the war ended and he turned himself in. He spent only 90 days in a

One of Life's *original photographers, Peter Stackpole now free-lances, specializing in the underwater world which has fascinated him since skin diving began.*

Tucker's famed gold and emerald cross—no fake in this photograph—has a removable back.

British prison because records of the exact time of his desertion couldn't be found.

After his release he returned to Bermuda and commercial fishing. The daily venture through the reefs sharpened his eye for everything that might puncture a bottom, until he habitually knew almost all the passages. He had also acquired some Desco masks which he connected with a rubber hose to an old compressor. With brother-in-law Bob Canton he frequently dove for metals other than scrap iron from modern wrecks.

Once the partners were offered some old power cable which lay in knee-deep water at the Royal Navy dockyard. Teddy lifted it and Bob started to cut it with a hacksaw. Suddenly there was a blinding flash, the blade disappeared and all the power went off in Somerset Parish. "What did it do to you?" I asked. "It shifted us a bit," replied Teddy.

In April of 1950, Teddy spotted some old cannons on the bottom near the North Channel. He raised six of them, a copper pot full of musket shot and a few pewter plates. He sold them to the Bermuda Monuments Trust for a mere $100 and promptly forgot about the old wreck. When he happened by the site some five years later, he began finding pieces-of-eight, then some gold and pearl buttons, two gold ingots, a gold bar, and finally the famous emerald-studded gold cross. Teddy refers to that wreck as the "Old Spaniard." The latest coin was dated 1592, and the wreck contained some fascinating artifacts collected from the New World, including Carib Indian bows made of black palm wood, an emu egg, as large as that of an ostrich, and a ceremonial staff.

The Old Spaniard treasure was Teddy's big find, but it brought the Tuckers the lingering fear that at any moment the "boys in blue" might arrive with an order to give up the loot to the government. For a while Teddy hid the treasure in a potato sack which he placed in an underwater hole in the shoreline near his house. "If they come for it," he said, "I'll pitch it to hell back in the sea."

Before long it was decided that the best strategy was to get the find as much attention as possible. Rumors of it were everywhere—and highly exaggerated. The first story broke in *Life* in 1956 with my pictures of Tucker and Mendel Peterson, then the Smithsonian's chairman of Armed Forces History, who was to authenticate the significance and the value of the pieces. With him came Edwin and Marion Link. Link is the retired industrialist whose diving equipment is used in underwater research (see SMITHSONIAN, August 1973). A meeting was held with Tucker, Bob Canton and a representative of the Colonial Secretary. A hasty figure was arrived at for the gold bar, which measured some 10½ inches, weighed about 36 ounces, and was stamped with mint marks and had a tiny chip missing from one end—the "assayer's bite," or commission. Link offered $2,000, based on twice its weight as figured on the market value of gold.

The government made a similar offer—so, under some pressure, Teddy sold the bar on the spot to his government. This set a precedent, and eventually the Tucker partnership sold the entire collection, includ-

Empty shell casings from World War I wreck rise to the surface by air bag to become umbrella stands.

These two Indian-head earrings were found 40 feet apart, along with coins dating from Spain's Philip III.

ing the cross and all the artifacts, to the government for $100,000—less than half the appraised value.

The way was now cleared for Teddy to search for other treasure with some protection. If he found more promising wrecks, he had to register the wreck and list all that he found. The government had first right of purchase at a figure to be arrived at by outside appraisers. If they didn't want whatever was found, Teddy had the right to sell elsewhere. But would Tucker ever find another treasure? Mrs. Clare Boothe Luce, after examining Teddy's loot, once told him that she thought the chances against his ever finding anything of value in the ocean again were a million to one. Teddy didn't have the heart to reach in his pocket and show her gold buttons he'd found that afternoon.

It was an ideal day for galleon hunting when I first took a leisurely cruise through the Bermuda reefs in 1959. The surface was flat calm, as the old black-hulled workboat made her way to the westward of the island. "What's that?" called Teddy, looking over the side. Three of us dove down for a look into a large sand hole surrounded by a reef. Within minutes Teddy was finding scattered pieces-of-eight. There was a cannon lying there with an imperfect off-centered bore, and as I ventured around the reef's edge I found a pair of brass navigational dividers looking as though they had been dropped the day before. Without making a note, checking a compass or marking a chart, Teddy returned to that wreck site, five miles off shore, day after day. She was the ship *San Antonio*.

During several years of working that wreck, Tucker found many coins dating to Philip III of Spain, some matching gold Indian-head earrings found 40 feet apart, along with a lot of majolica pottery. My thrill came when I chanced to work my hand through the sand under the edge of the bottom planking, and felt something solid. I pulled it out gently, thinking it just another encrusted iron spike, but at one end there was a hexagonal black bead. Teddy studied it a moment and then pointed to objects covering the entire length. In my haste to show it to him I'd neglected to observe these clusters of circular forms clinging to the shaft. Cracking open my find on deck, we uncovered 48 perfect pieces-of-eight, preserved because they had been clustered around a dagger's steel blade. Without touching steel or good metal, a silver coin will disintegrate as a result of electrolysis.

If there is one quality that accounts for Tucker's success at salvaging interesting artifacts, it is patience. Once he has jumped overboard barefooted with his

Desco mask and his heavyweight belt, he may stay on the bottom for five hours without bothering to come up for lunch. In 85-degree water some 30 feet down it's pleasant enough for one to forget about time. But it's a good idea to quit diving late in the day, when the sharks become more active. I counted eight of them around us late one afternoon while working on the Old Spaniard, and they circled ever closer until we decided to reboard the boat. "Never let one of them get between you and the ladder," Tucker advises. "Sometimes they seem friendly, but now and then you can look one in the eye and see that he's got a lot of rudeness on his mind."

It would be a safe bet that Tucker will always discover some treasure but, as others have found, it's time-consuming business and doesn't pay any bills while you are doing it. He can always go to non-treasure wrecks such as *Caesar,* sunk in 1818, and pick up grindstones measuring from eight inches to five feet in diameter, which make fine stepping stones in grass terraces. In the same wreck he found some rare bottles with the Masonic emblem on one side and the American eagle on the other, made by Henry Schoolcraft in Boston at the turn of the 19th century. Another rare bottle, found only in this particular wreck, is the melon flask, a flat, rounded-profile bottle with flukes, which is now valued at almost $2,000.

Even the flint ballast rocks found on the bottom at the site of the Old Spaniard are sold at the gift shop run by Edna Tucker at the base of Gibbs' Hill Lighthouse. Cut and polished, they make fine bookends.

Once Tucker sold his original treasure, he had no trouble finding sponsors who would pay the costs of "a dig" for a month to six weeks every summer. The Smithsonian Institution, with the help of private sponsors, organized ten such summer activities involving several early wrecks, and got permission from the Bermuda government to allow export and restoration of many historical artifacts now on display in its Underwater Hall.

The Tuckers live in a 340-year-old limestone house, built originally by whalers at King's Point on the western end of the island. It faces the beautiful little harbor of Mangrove Bay, graced by sailboats and boating picnickers who make use of Teddy's two little islands just off the point. Teddy and Bob Canton can be found almost any time at the Tucker dock, working on engines, compressors, pumping up scuba tanks, cleaning fish or making up a mooring for someone. Tucker's boat has a 48-foot heavy-duty commercial hull designed to his specifications, and is capable of going almost anywhere. In winter, the green shutters at the King's Point house are kept closed while the wind drives the salt spray against the western side of the house. There is no heat except for two fireplaces, and wood is scarce except for driftwood. Behind the house is a tub filled with such iron objects as 17th-century tools, cannon balls, leg irons, an iron crossbow mechanism and part of an old pistol. They have been soaking in a solution of lye and mossy zink for more than a year and are just about in a state of permanent rust-free preservation.

On warm evenings the Tuckers often eat at the corner of the house under a huge umbrella-shaped royal poinciana tree, by the light of an old lantern. The menu from the deep freeze, if there hasn't been time for recent fishing, might be barracuda, bonito, hogfish, snapper or even shark, which Teddy cooks expertly. After dinner and a check on *Explorer*'s dock lines, Teddy will suggest going up to the veranda to "cool out." Stretching out on deck chairs always seems a good idea after a long day of diving. It's a nightly event—just lying there talking about the young divers who have worked so hard that day sifting sand and moving ballast.

Rewards for Tucker's efforts come in different forms. Groups of divers will pay well to put in hard labor at his side just to study an old wreck. Visitors have included a governor, two astronauts, some Secret Service men, a man from Scotland Yard, wealthy yachtsmen, a poet, writers and divers from everywhere. TV crews have made use of Teddy and his facilities with regularity. At the end of the season he will occasionally stop the boat over a small sand hole to "scratch around" for a few hours on another recently discovered, unidentified wreck, one of several promising ones he'd like to investigate—if only he had more time.

Tucker checks the hitch on grindstone rising from the wreck of a cargo ship that sank in 1818.

Indian puppets, caparisoned, bedizened and otherwise decorated, have faces which are more expressive and eye-filling. They populate a rich literature of war, love, politics and extraordinary adventure.

By John Bernard Myers

Puppets probably preceded people on world's stages

The diminutive, yet larger than life, universe of puppetry, an ageless form of beguilement for all, must now compete with other diversions

The noble, ancient and adored art of puppetry may be edging toward an endangered species list of its own, although I hope not. Over the ages, puppets and their masters have given pleasure to all classes of societies, among them the young, the old, the naive and the sophisticated, the poor and the rich. Their fascination has been universal and timeless. And, in many cases, puppet shows seem to have preceded performances by people—perhaps because of the superstitious awe with which various peoples responded to idols and statues, particularly if they moved.

Puppets have been imbedded in mankind's memory for so many centuries that even today some of that awe, as well as all of that delight, continues to work magic for those audiences able to find professional, or even amateur, performances. But the chances of this art's surviving in the face of such popular contemporary diversions as film and television could be doubtful, although it may continue as an adjunct to mass communication, useful in commercials, propaganda or education. If so, the magical element of puppetry will have been lost, because it is the experience of being in the actual presence of puppets—at once real and unreal—that causes one's imagination to flower, opening another realm of feeling and seeing.

Such reactive emotions have a long history. In primitive times, the shaman or witch doctor divined the power of an animated artifact and pronounced that supernatural forces could direct, cure and present omens through these sacred objects, for the spirits had entered the objects and had become them. This is as true for Zuñi and Hopi serpent puppets as it is for the slow-moving idols of the Egyptian priesthood, whose mechanized statues raised an arm or turned a head.

The religious aspect of dolls and puppets has been universal in both the West and the East. Where idols have been banished, puppets have survived in the form of shadow theater, probably the most widely distributed tradition of puppetry. The shadow theater has been popular for centuries from North China throughout Southeast Asia, most of India, the Middle East and Northern Africa. The extent and variety of this form of theater makes the rest of the world's puppetry seem a bit meager by comparison.

But any form of traditional theater in Asia has a significantly different meaning from what we in the West consider theater. Walter A. Fairservis jr., research associate at the American Museum of Natural History and professor of anthropology at Vassar, has written that Asian drama "is not to be categorized as mere entertainment, for its basic purpose is to provide cultural security and personal identity for all citizens of the culture involved. Much of Asian drama recounts the myths, legends and stories which are the familiar descriptions of why things are what they are and why people and gods do what they do."

Whether performed by people or puppets, Oriental theater is ritualistic; the audiences want their beliefs and hopes reinforced. They demand to see and hear the same stories retold, but the range of the stories is vast—often the plots and characters are taken from such epics as the *Ramayana* and the *Mahabharata*. These Sanskrit texts with their hundreds of characters, their extraordinary adventures, battles, love affairs and political struggles, in which both gods and human beings are similarly engaged, offer a rich and endless imagery to the theater of the puppet. A shadow play goes on often until dawn; the spectators watch and listen for hours as Rama wins the hand of Sita by bending the magic bow, or an ogre takes the shape of a golden deer. An army of monkeys assists Rama in his war against the wicked Ravana. Sita patiently undergoes ordeal by fire to prove her purity. Rapt spectators watch the endless adventures dramatized from the epic *Mahabharata,* recounting the rivalry between the Pandava and the Kaurava brothers —the former, men of great virtue; the latter, a hundred brothers in all, unscrupulous warriors, avid for power. The prince Krishna is powerless to stop the feud, which is followed by the Great War with multitudes of soldiers being killed.

Chinese shadow theater (pp. 76-77), somewhat dif-

The author owns an art gallery in New York, and is an ardent student of puppetry.

Photographs by Nina Leen

Procession of Chinese shadow theater puppets moves casually across SMITHSONIAN pages as entrancingly as they do in the imagination of millions of fans throughout Asian world.

In Western world, puppets mean Punch and Judy. This 19th-century cast, maybe America's oldest, was on circus circuit. Left to right, Crocodile, Ghost, Policeman, Judy, Punch, Baby and Devil.

ferent from the Indian and Southeast Asian varieties, dates back to 206 B.C.–A.D. 221 and has three main repertoires: religious, military and civil.

The religious stories were taken from Confucian, Buddhist and Taoist sources; the military plays were drawn from history, especially dynastic struggles; the civil plays were romances, comedies, farces, burlesques, themes drawn from everyday life. The exquisite animated figures, intricately cut from animal hide, were colored so that the translucent material could cast jewel-like shadows on the lighted screens behind which they were manipulated. The productions were lavish and technically ingenious. Characters moved before mountains and rivers, palaces, gardens, pagodas. Processions, dancing lions, tumblers, marching soldiers, battle scenes, ships at sea were regular features of these inventive and exciting performances. (The American Museum of Natural History has in its possession more than a thousand puppets, marionettes, rod-puppets and shadow figures collected in China in 1902 by the great Asian ethnologist Berthold Laufer.)

A favorite heroine of many of the Chinese shadow plays is the White Snake Lady who is usually depicted as a young girl in love, a faithful wife, a tender mother. She is capable of fantastic deeds involving magical cures or heroic rescues. Stories were often culled from such lengthy "historical" treatises as *San Kuo Chih* (Romance of the Three Kingdoms), *Hsi Yang Chi* (Journeys to the West), or *Shui Hu Chuan* (The Water Margin), books which contain a blend of fact and poetic imagination, and are storehouses of dramatic spectacles.

Chinese ingenuity had a major influence on the theater of Asia. The technical range was developed into many forms and silhouette productions grew ever more elaborate. The Japanese, however, nourished a distinctive art of their own, *Bunraku*, the "doll" theater which began in the early 17th century and by the 18th century had become the favored popular entertainment of the island nation. A *Bunraku* is impressive. Usually around four and a half feet high, the heads splendidly carved and painted, the "dolls" are dressed in stiff brocade, elaborate coiffures, gorgeous sashes, swords, fans. The fanciful figures dominated Japanese theater for generations and Chikamatsu, perhaps Japan's greatest playwright, wrote more than a hundred plays for *Bunraku* exclusively.

Some of these plays are still being performed in Kyoto. The narrative poetry is recited at one side of the stage, an orchestra accompanies the action. Each "actor" is manipulated by three puppeteers, two robed in black who work the arms and legs; a third who wears a fine kimono and fan. Audiences become so absorbed in the action that the robed men manipulating the dolls in full view soon seem to disappear.

Gods and human vulnerabilities

Elsewhere, Indian and Chinese influences can be traced throughout the Malay Peninsula as well as in Java, Bali, Thailand, Vietnam, Cambodia, Laos, Burma. Although the stories varied from place to place, depending on local beliefs and needs, they were, in a sense, more alike than different. Fairservis explains: "The Asian drama has been a ritual drama because Asians have believed that a performance is a ceremony which given in the routine of time reinforces Asian awareness of the cosmos: of the meaning of the cycle of lives, of the family, the court, the gods, the land, human vulnerabilities, the mystery of things. Asian spectators know the plots of the drama by heart; they know what to expect."

Today much of the ritualistic meaning has changed. In many Southeast Asian countries—particularly Laos, Cambodia, Vietnam—the puppet theater is employed in the villages and back country for purely political purposes, though it still has ritualistic meaning.

It is probable that the westward movement of Mongol nomads brought the shadow theater as far as Turkey by the 13th century. The Turkish "hero" was called Karagöz, a buffoon with a hunchback, black

circles around his eyes, a big nose. Puppets had ceased being gods and heroes with this beguiling rascal, whose obscenities, boldness, sharp tongue and bad behavior made him the perfect instrument for social and political satire. Karagöz packed the coffeehouses even during the holy days of Ramadan. Often outlawed, he would reappear, a scamp who couldn't be suppressed, whose improprieties caused too much hilarity. The spread of the Ottoman Empire took Karagöz to Greece, the Balkans, Algeria and Tunisia.

Beyond that it is difficult to be precise about the dispersal of puppets geographically or their specific use and meaning historically, other than to say that, in general, puppets and marionettes in Europe and the Americas were vehicles for entertainment that was usually broad, farcical and popular.

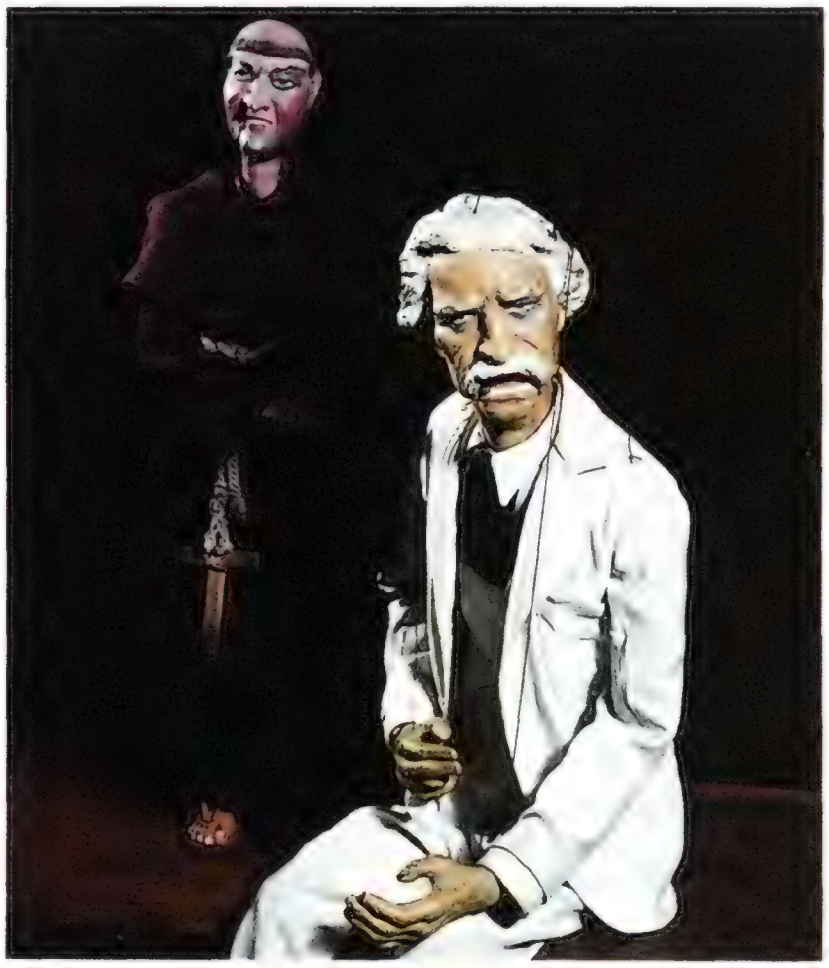
There are exceptions to this generality. The Roman Catholic Church employed animated figures to dramatize sacred tales, and in particular the crèche has been used to celebrate the birth of Jesus at Christmas time. In later centuries these figures became immobile, but there is evidence that both mechanized dolls and puppets served the church during the Middle Ages and as late as the 18th century. Certainly the morality plays enhanced the action with demons and monsters that were manipulated constructions, for instance, the opening entrance of Hell shaped like the jaws of a hideous dragon breathing flame and smoke through which sinners must pass.

The secularization of the theater was rapid and the popular figure of masked pantomime and improvisation (the commedia dell'arte) became the marionettes that bore names similar to those of the comedians who capered over the boards in 16th- and 17th-century Italy. Stylized, crystalizing specific characteristics of men and women, the influence of these entertainments was enormous on every form of theater.

Examples of every type of puppet are in the collections of the Detroit Institute of Arts, where the majority of these pictures were taken, New York's American Museum of Natural History and the Smithsonian's Cooper-Hewitt Museum in New York.

In the United States, Paul McPharlin probably did more than anyone else to bring together a fine collection of puppets and documents relating to puppetry. Born and bred in Michigan, McPharlin's collection at the Detroit Institute is of special interest in that it contains a wide variety of figures with particular em-

A Remo Bufano production of Manuel de Falla's modern Spanish opera, *El retablo de Maese Pedro,* focuses here on an episode from *Don Quixote.* The marionettes are approximately three feet high.



Garrulous figure of Mark Twain as he appeared in prologue of Tony Sarg's *A Connecticut Yankee in King Arthur's Court.* Sarg, who died in 1942, was a major figure in American puppetry revival.

Child-sized, an impressive samurai of *Bunraku,* the "doll" theater of Japan, towers (for a puppet) 50 inches high. By 18th century *Bunraku* had become most popular entertainment of the nation.

This demure little queen was created for lighting experiments of designer Edward Gordon Craig.

phasis on the American. His book, *The Puppet Theatre in America, A History: 1524 to Now,* gives a detailed account of the art from the 16th to the 20th century and includes a description of puppets used for religious purposes among North American Indians. Since his death in 1948, McPharlin's organization, the Detroit Marionette Fellowship, has continued as an advisory group helping puppeteers with technical problems. The Institute's theater department has continued adding to the collection and playing host to visiting companies, among them Tony Sarg, the Salzburg Marionettes, the Teatro dei Piccoli, Burr Tilstrom, Bil Baird, the Lancaster Puppets and the greatest of all puppeteers, Sergei Obraztsov, director of the State Central Puppet Theatre in Moscow.

Obraztsov is a comic genius, as original in his way as Charlie Chaplin. Never political, he is very adroit at exposing human vanity, pretentiousness and folly. His puppet of Carmen with her spit curls and exaggeratedly long arms epitomizes every soprano whose need to be a diva is more important than any aria she may be singing. Obraztsov performs a love scene with nothing more than two tennis balls on the tip of each first finger. Faceless and bodiless, it is the ultimate comment on passion between Him and Her. He also has a tiger who gets bored with his pompous and tyrannical trainer and amiably devours him. Laziness, snobbery and double-dealing are made subjects for laughter by the good-natured Obraztsov.

At the Detroit Institute, Professor Audley Grossman, the curator of Theater Arts, and Mrs. Ellen Proctor, conservator for the puppet archives, are continuing the tradition of encouraging "live" performances, both at the Institute and by community groups. The museum's program for young people called Youtheatre is active in puppetry. Of the 34 productions scheduled for the 1974-75 season, one-third of the live shows are in the field of puppetry. (The Smithsonian has maintained its own resident puppet theater since 1968.)

The Detroit Institute, like most museums across the country, is high in ambition and low in funds, particularly for puppets and their conservation. Hundreds are stored in a basement workshop awaiting repair and there is only Mrs. Proctor, a retired puppeteer, to do the necessary work. Only a small part of the collection can be displayed; documents are reserved for students of theater history—when the museum library is open. Here again staff has been curtailed. Detroit, like other cities, is having a difficult time affording culture.

"I sometimes feel as a bird watcher does about the whooping crane or the peregrine falcon," says Professor Grossman. "Those of us who care are doing what we can."

Robert Edmond Jones designed these figures for first American showing of Stravinsky's *Oedipus Rex*.

By Daniel Jack Chasan

A pioneer feels atom is still our best answer

Alvin Weinberg has given his life to the peaceful atom, only to find out that in some circles he is one of the bad guys

Several years ago, apropos of some edifying late-night conversation, I lent a radical friend a copy of *Reflections on Big Science* by Alvin M. Weinberg, who was then director of the Oak Ridge National Laboratory. A few weeks later, my friend returned the book. He said it had astonished him. "I figured that anybody who ran a big national laboratory had to be a bad guy," he explained, "but Weinberg is obviously O.K."

When Weinberg resigned as director of Oak Ridge in December 1973, *Science* magazine said, "Alvin M. Weinberg, one of the nuclear establishment's preeminent visionaries, has retired as director of the Oak Ridge National Laboratory, a job he has held since 1955. . . . In 18 years as ORNL's director, Weinberg led the laboratory out from under its military shroud and into a new role as a center for biological, environmental and peaceful energy research. He himself emerged as an important conceptualizer of new reactor types, a commentator on science-government relations and an enthusiastic—sometimes controversial—advocate of a nuclear-powered future."

I remember very clearly meeting Weinberg for the first time at Oak Ridge, in the spring of 1968. Ushered into his office, I found a short, slim, gray-haired man, who bristled with energy and enthusiasm, ready on short notice to walk across his office to the blackboard to illustrate a point. Our main discussion was about the breeder reactor, the species of nuclear reactor that produces more fuel than it consumes. By now, of course, the breeder has become a public enemy of the American environmental movement. But at that time, although the United States had been operating experimental breeders since 1951 and the development of a commercially viable breeder was already the AEC's top nonmilitary priority, the subject had aroused little public interest. It was, however, a subject that had long been important to Weinberg.

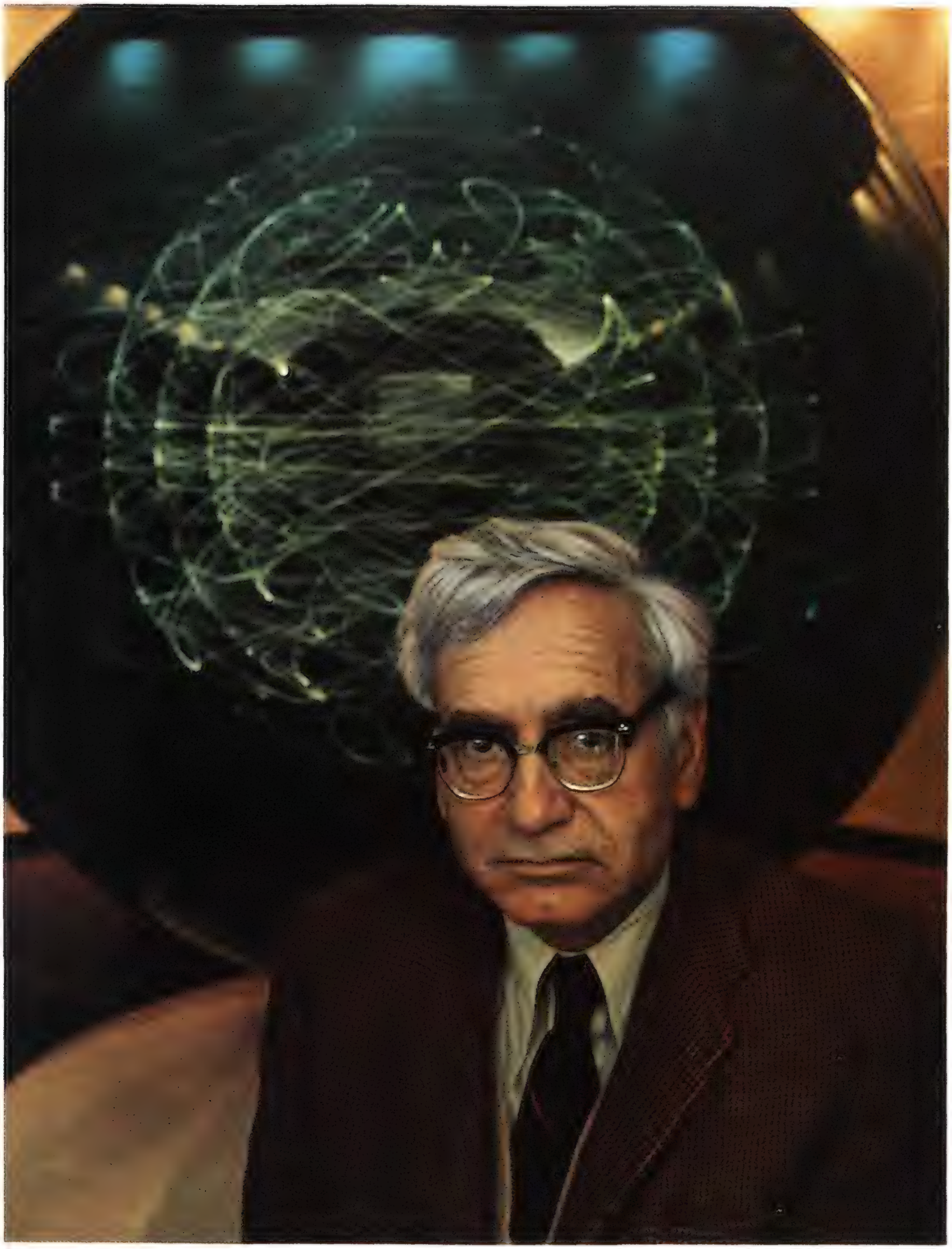
Drawn into nuclear research at the Chicago Metallurgical Laboratory as a young biophysicist at the beginning of World War II, Weinberg became an assistant to the great Hungarian-born physicist Eugene Wigner, and together they worked out the first design for a breeder reactor in 1943. After Chicago, Weinberg had continued in nuclear work at Oak Ridge, becoming director of research in 1948. From the early 1950s on, he had literally believed that the breeder was likely to save the world.

"The development of breeders could well turn out to be the most important technological enterprise man has ever undertaken," Weinberg told me with conviction. "Energy is the ultimate raw material." If breeders could furnish "an unlimited energy source available to all, it would be possible to desalinate seawater, and if this were combined with the modern development of water-conserving agriculture, it would form the technological base for greatly reducing the disparity between rich nations and poor. If we did that, we would eliminate the main source of international tension."

Weinberg explains that he had thought about the breeder's potential during the 1940s, but didn't become a real believer until he read a book entitled *The Next Million Years*. Written in 1952 by a grandson and namesake of Charles Darwin, it argued that all kinds of terrible, Malthusian things would happen to the world unless the development of nuclear fusion made energy cheap, plentiful and inexhaustible. Darwin was wrong about fusion, Weinberg decided, but right about the potential role of energy. For the prospect of using fusion reactors to burn the heavy hydrogen in seawater, Weinberg substituted the prospect of using breeders to burn the uranium and thorium in the Earth's crust. Then he went out to sell his vision. "I got very enthusiastic," he recalls. "I wrote an article entitled 'Energy, as an Ultimate Raw Material —or problems of burning the sea or burning the rocks' in which I said I'm a rock burner, largely because I was so skeptical about burning the sea."

The great disadvantage of fusion, Weinberg believed, was that it had never been and might never be made to work, although he certainly believed we

Daniel Chasan is a frequent contributor to the pages of SMITHSONIAN; *he most recently wrote on an unusual zoo and a pioneering heart surgeon.*



A pensive Alvin Weinberg contemplates the future in this study by Yoichi Okamoto. Behind him is a model of a uranium atom, symbol of cheap energy about which he has dreamed for 30 years.

should keep trying. I told him recently of a telephone conversation with Eugene Wigner in which I had asked Wigner if he'd care to venture a prediction about when fusion power might become available, and Wigner had replied, "No. In 1950, I bet money that we'd have fusion reactors working by 1957. I paid the bets. Now, I don't want to guess." When I had finished telling the story, Weinberg said with some satisfaction, "He made those bets with *me*." Weinberg hasn't changed his mind. Despite recent optimism about fusion—among other things, as a safer alternative to breeders—Weinberg has remained skeptical.

As for solar energy, which is often discussed as an alternative to both breeders and fusion, Weinberg observes, "The main trouble with solar energy is that it's so goddamned expensive." If the world decided to pursue solar-produced electricity instead of fission, he suggests, and if it remained expensive, the high cost "would mean that fewer people would have access to it, and more people would starve to death."

The basic technology of breeder reactors is a much surer thing. All reactors work in essentially the same way; atoms of uranium or plutonium split, producing neutrons and a great deal of heat. A coolant flowing through the reactor core carries the heat outside the reactor where it can be used to make steam and drive a perfectly conventional turbine generator. Some of the neutrons strike other uranium or plutonium atoms in the core, splitting them and releasing more heat and more neutrons, which in turn split other atoms, and so on ad infinitum in the process called a chain reaction. Some neutrons escape the reactor core, however, strike surrounding atoms of uranium-238 or thorium-232, which can't be used as reactor fuel, and change them to plutonium-239 or uranium-233, which can be used.

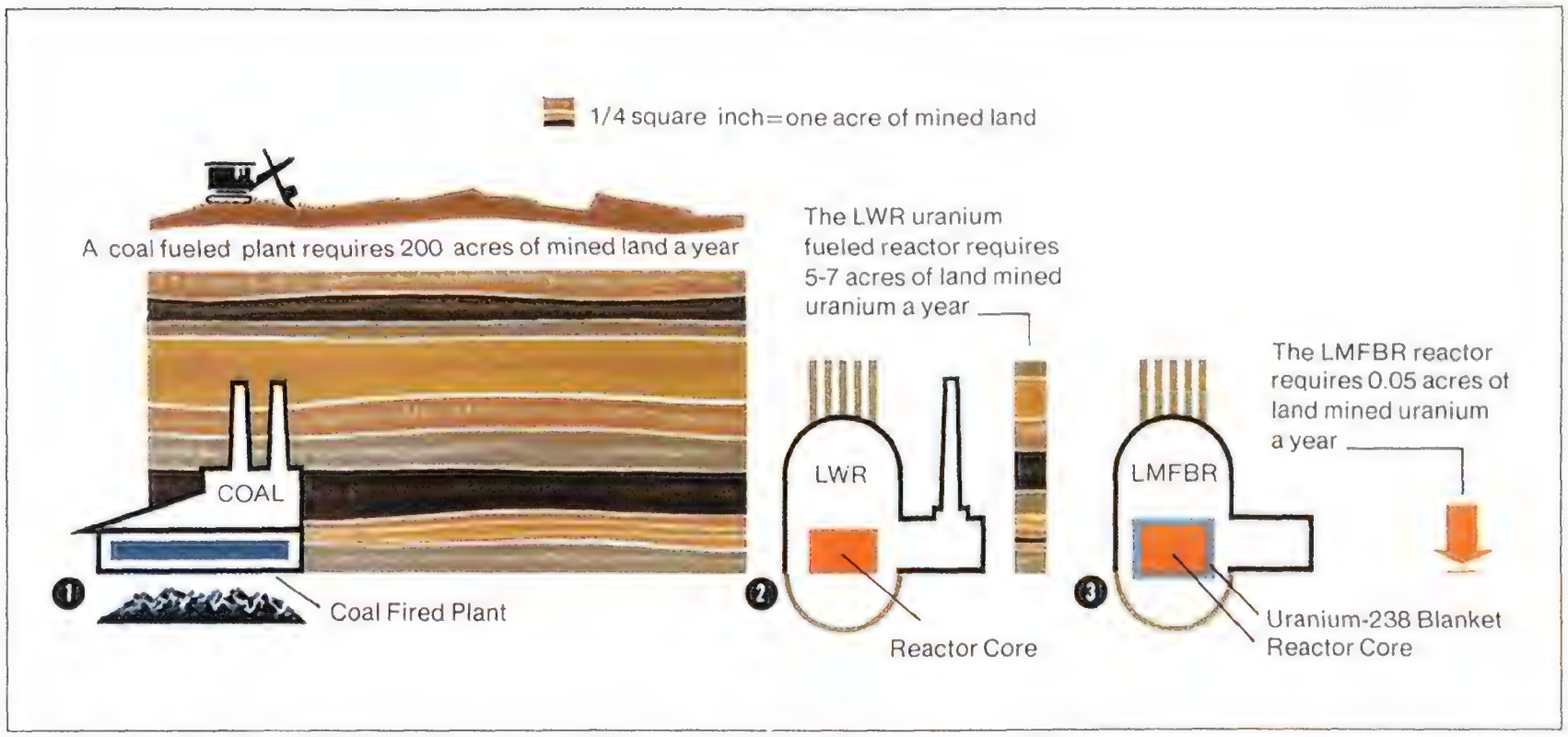
Virtually all reactors produce some new fuel in this way. They have been doing so since 1944, when the first of three big reactors designed under Wigner at Chicago and built at Hanford, in the desert of eastern Washington, began turning out plutonium for nuclear bombs. But the breeder differs from other reactors in that it produces *more* fuel than it consumes. The first experimental breeder began operating in the Idaho desert in 1951, where it became the first reactor of any kind to generate an appreciable amount of electricity. By the spring of 1968, when I had that first conversation with Weinberg, it looked as if nuclear power might finally be about to take off.

The launching still is a long, long way off, however, and the last several years have not confirmed Weinberg's visions or hopes about nuclear power. For one thing, his own ideas about breeder research were never translated into official policy. The United States and every other major industrial nation except Canada has committed itself deeply to developing a species of breeder called the liquid metal-cooled fast breeder reactor (LMFBR), which uses plutonium as a fuel and molten sodium to cool the reactor core. Weinberg had thought it would be wiser to pursue several lines of breeder research and defer a commitment to any one of them. He still believes that "the world has made a mistake by pursuing, really seriously, only one line of breeder research." His own favorite concept had been something called a molten-salt breeder reactor, which would have used uranium-233 as a fuel, and would have kept it circulating through the reactor in solution with the cooling liquid. Weinberg believes that if the molten-salt breeder were built and it worked as conceived, it would be cheaper and less complicated to run than the LMFBR. (On the other hand, it would provide a much smaller margin of error—any significant technical difficulty would cause it to produce less fuel than it burns.)

Critics say he's unrealistic

Weinberg's fondness for the idea of a molten-salt breeder typifies what some critics have long considered his technological idealism, his tendency to work up enthusiasm for devices that are great on paper but impractical or downright impossible in the real world. A former official of the now-defunct White House Office of Science and Technology recalls that when Milton Shaw was director of civilian reactor development for the AEC, "He always used to say to me, 'Alvin can build these things, but he can't make them work.' " But Murray Rosenthal, who directed the molten-salt reactor experiment at Oak Ridge, where he worked under Weinberg for 20 years, takes exception to the charge that Weinberg is unrealistic.

"I think it's a matter of how far ahead one looks,"


1/4 square inch=one acre of mined land
A coal fueled plant requires 200 acres of mined land a year
COAL
Coal Fired Plant
The LWR uranium fueled reactor requires 5-7 acres of land mined uranium a year
LWR
Reactor Core
The LMFBR reactor requires 0.05 acres of land mined uranium a year
LMFBR
Uranium-238 Blanket
Reactor Core

The striped areas above are a graph of how much land is disturbed annually to provide fuel for 1,000-megawatt power plants fueled by coal, conventional light water reactors and breeders.

In the breeder reactor at right, note that core is surrounded by a blanket of uranium-238, itself unusable, but which is turned into usable plutonium by neutrons coming out of core.

Rosenthal says. "I think he'll turn out to be right. Alvin's vision is remarkable." Rosenthal points out that Weinberg has already been ahead of his time more than once—as he was in the 1960s, when he began talking about clustering reactors in "nuclear parks," where they would be far from population centers and easy to protect.

Weinberg has an uncanny "ability to recognize what's important," Rosenthal says. "He can look into a maze of things and not get bogged down. In a technical sense, Alvin has a remarkable ability to understand *everything*." In a similar vein, the Nobel prize-winning physicist, Hans Bethe, has observed that "Weinberg is a very thoughtful person. He goes at matters by really trying to find out what the basic ideas are, rather than continuing on a course that has been arbitrarily set."

Rosenthal has also been struck by Weinberg's ability to focus on individual people and their interests. He remembers clearly that soon after he went to work at Oak Ridge, the head of his laboratory walked in with Weinberg, who was then director of research. It seemed an occasion for muttered formalities but, unlike other administrators Rosenthal had encountered, Weinberg seemed genuinely interested in what he was doing, asking real questions, making real suggestions, not just going through the motions. Obviously, people and human relationships have continued to be important to Weinberg. A relative, friend or acquaintance who encounters him before going on a trip is likely to take along one or more names of other relatives, friends or acquaintances and instructions to look them up—as Weinberg himself would do if he were going.

The development of breeders has also run into problems that seem to transcend the choice of a particular reactor. A major problem is economics. Even with current, conventional reactors, "the big reactor manufacturers are losing their shirts," Weinberg observes, and utilities have canceled or delayed 70 to 80 orders for new nuclear plants. Construction costs for nuclear plants have more than doubled in constant dollars since 1967, while capital has become harder to get. Breeders seem a more and more expensive proposition. The chance that they can compete economically within this century may already be slim. The environmentalists who oppose breeders on grounds of public health and safety now argue that the devices seem economically infeasible, anyway.

The cost of the first big, commercial-scale breeder "demonstration plant" being built at Clinch River, Tennessee, has soared in three years from $400 million to $1.7 billion. None of the nations or companies developing breeders has given up on them yet, but certainly there is no longer any hope that the breeder will make energy as cheap as Weinberg once envisioned. New technical considerations and inflation have already pushed the cost to at least ten times the

Weinberg and his wife Gene relax in their Oak Ridge home. He is now a lecturer and consultant.

level he had considered plausible. Not long ago, I reminded Weinberg of his optimism of the late 1960s. As I spoke, he kept nodding impatiently and muttering a brusque "yes, yes." When I finished, he said, "I've learned two things: If you want to predict the future, wait until you're old, and even then, don't put it on paper." In brief, he had hedged on his earlier hopes, and "I don't mind telling you, it has been one of the great disappointments of my young life" that things didn't turn out as he had thought.

Not that he has totally abandoned hope; he still believes that breeders can make the world of the future a bit more bearable than it would otherwise be—that they can insure survival, if not the millennium—and, therefore, he believes that they should be built. The essential fact, he argues, is summed up by the graph in the Project Independence blueprint that shows two ascending lines, representing the supply of and demand for oil and gas, rising parallel into the 21st century, then curving sharply away from each other, with supply plunging toward oblivion and demand heading for the sky. He doesn't believe the world can count on either fusion or solar energy to bridge the gap. And even if it were technically possible to mine enough coal to do so, it would probably be environmentally unacceptable. Energy conservation can postpone the point at which the lines diverge, he says, but can't hold it off indefinitely.

This means, he argues, that we had better be developing alternatives to oil and gas. For automobiles, we had better develop battery-powered motors, and we had better not wait for private industry to do it. For generating electricity, we had better keep working on fission reactors. And since breeders would make much more of the Earth's crust available for burning in fission reactors—only .7 percent of the Earth's uranium is U-235, which can be burned in present-day reactors, but the other 99.3 percent is U-238, a large part of which can be transformed by breeders into reactor fuel—we had better keep working on breeders, too. He isn't arguing that breeders should be rushed into commercial operation as soon as possible; he isn't even sure that the current reactors should be operating commercially—and he certainly doesn't think that the profit-and-loss considerations of reactor manufacturers and private utilities should determine U.S. policy on such matters. But he does think that we would be well advised to have breeders ready when we need them.

Nor does he believe that the currently widespread fear of nuclear energy changes this. At worst, he says, "It's just a matter of how you want to go," and the risks associated with nuclear development seem preferable to the virtual certainty of widespread starvation in a world that is desperately short of energy.

Actually, he believes, and has been saying since the mid-1960s, that if we can't control population growth, not even breeders can save us. His thinking about problems of population and poverty seems to have been brought into focus by his own travels in India and Pakistan. When confronted physically by the sight of, say, Calcutta or confronted intellectually by

the thought of it, even his optimism has tended to flag. He is also enough of a believer in Western-style political democracy to be disturbed by the fact that, with similar population problems, India seems to be foundering badly while China seems to be doing quite well.

Unlike many people who have been involved in the building of nuclear reactors, however, he doesn't dismiss the fears of what he calls the "anti-nuclears" as idiotic or cynical. He simply thinks—and hopes—they're wrong. Not that he has ever had much patience with hostility toward current science and technology *per se*; in 1970, during Congressional hearings on national science policy, Weinberg was asked for his views about the "countercultural" attacks on science and technology. "Well," he replied, "look at the length of my hair and the color of my hair and you will understand my reaction to the countercultural attitude. . . ." (His hair is a bit longer these days.)

There has always been a certain public fear of nuclear energy. The promise of cheap power and the years of educational campaigns about "our friend the atom" notwithstanding, people still conjure up the image of the mushroom cloud and have seldom welcomed reactors in their backyards. Since the late 1960s, however, the fears have become much more sharply focused. In the hands of well-organized environmental groups, which have used them as the basis of legal suits and political lobbying, they have become the bête noire of nuclear development.

The main fears have been of an explosive accident that sends radioactive debris out through the heavy protective walls surrounding a reactor, or of some mishap in the handling or storage of reactor fuel and radioactive reactor wastes. The prospect of the LMFBR, which, unlike the current reactors, will use plutonium as a fuel, has intensified the fears. It is possible that terrorist groups of foreign nations that managed to steal some of the plutonium could use it for making nuclear bombs. It is certain that plutonium-239 requires 24,000 years to lose even *half* of its radioactivity (see SMITHSONIAN, April 1974); in the meantime, it is extremely carcinogenic, and the radiation it produces can, like all other forms of radioactivity, cause genetic damage. How can a nation filled with breeders keep many tons of this stuff in circulation to and from reactors without theft or mishap? How can the nation commit itself to safe storage of many tons of radioactive plutonium waste for hundreds of thousands of years?

Nuclear parks would reduce safety hazards

Weinberg doesn't just dismiss these questions. He is optimistic that a way can be found to reduce the necessary storage time to, say, 600 years. He suggests that if reactors and chemical plants were grouped in remote "nuclear parks" they would not be close to many innocent bystanders, it would not be necessary to ship fuel to or wastes from the site, and security could be made very tight. He says the main argument against nuclear parks, if one assumes that the heat can be dissipated in an environmentally acceptable way, is economic: Utilities prefer to build generating facilities as close as possible to population and industrial centers so they won't have to string long transmission lines and won't lose much electricity during the process of transmission. Again, he doesn't believe that the nation's policy on such matters should primarily be determined by considerations of profit and loss.

But he doesn't ask anyone to believe that nuclear parks or anything else will eliminate the risks and questions at one stroke; for one thing, he observes, a commitment to store hazardous material for even 20,000 years "presupposes a kind of eerie institutional stability." The only thing he knows of that compares to that commitment, he says, is Hitler's insistence that his architect choose building materials that would last through the full lifetime of the Thousand Year Reich.

He is also willing to concede that plutonium is dis-

concertingly special. "Have you ever held the core of a nuclear bomb in your hand?" he asks, cupping his hands before him. "No, I don't suppose you have. Well, it's *warm*. The metal is *warm*, because the plutonium is emitting alphas."

About the effects of extremely small amounts of radiation, he is less sure. In 1970 John Gofman and Arthur Tamplin of the Livermore Laboratory were making very large waves indeed by contending that if everyone in the United States received the amount of radiation that the government classified as "safe," there would be 32,000 extra cancer and leukemia deaths each year. Weinberg disagrees with this estimate and has suggested, in an editorial in *Science*, that the effects of low-dose radiation should be included among the "questions that can be stated in scientific terms but that are in principle beyond the proficiency of science to answer." In a recent paper he wrote, "I proposed the term 'trans-scientific' for such questions. For example, the biological effect on humans of very low-level radiation . . . will probably never be fully ascertained, simply because of the huge number of animals required to demonstrate an unequivocal effect. Estimates of extremely unlikely events (such as a serious reactor accident) can never be made with anything like the scientific validity that one can apply to estimates of events for which there are abundant statistics.

"In the current attempts to weigh the benefits of technology against its risks, the protagonists often ask for the impossible: scientific answers to questions that are trans-scientific."

Irwin D. J. Bross of the Roswell Park Memorial Institute quickly took exception to Weinberg's ideas. In a letter to the editor of *Science*, he argued that Weinberg's editorial "reflects a very narrow view of 'science'. . . . The real issue is whether scientists are willing to face up to their responsibilities, or whether they will play language games to escape these responsibilities. Are we going to debate whether an issue is 'trans-scientific' or not, or are we going to go out and get hard data which will settle the issue? The need is not for 'trans-scientific debate,' but for effective measures to protect the public against low-level radiation."

Under a Weinberg plan, nuclear power plants, along with heavy industry, would be situated in parks far from population centers. This could reduce the risk to city dwellers from accidents.

Weinberg replied that he was "prepared to concede that an issue which appears to be trans-scientific at one stage of scientific development may, at a later stage, be susceptible to resolution by a more sophisticated science. I doubt whether most experts in either radiobiology or epidemiology would agree at this time that the effects of radiation doses of about 10 millirads per year (the present AEC standard for reactor emissions), or even the 170 millirads per year previously accepted, can be shown to have an unequivocal effect on humans. On the other hand, if the sample is large enough and if the studies can be successfully carried out over a long enough time, then I agree there is no reason *in principle* why the issue cannot be resolved. The disagreement then is mainly one of deciding whether the enormous effort required for such studies is an appropriate allocation of resources."

For the present, Weinberg feels strongly that the basic conflicts over nuclear energy aren't amenable to solution by hard science. His inclination to ponder philosophical questions and his willingness to see both sides of the nuclear coin, have won him the respect of a good many environmentalists, but David Freeman, who directed the Ford Foundation's massive energy study, suggests that he can be misleading: The essential thing about Weinberg, Freeman says, is not that he's philosophical and sometimes critical, but that he's pro-nuclear. As Weinberg himself points out, after more than 30 years in the nuclear business, he couldn't very well be anything else. But when he considers describing the experience of those 30-odd years, by this time he thinks in terms not of a pro-nuclear tract but of an ironic novel.

"Who could have dreamed, 20 years ago, that this great good thing, nuclear energy, would become a heavy," he mused recently, "and especially a heavy among the intellectuals." That intellectuals have grown to mistrust the makers of reactors as intensely as the makers of nuclear weapons is clearly a source of lingering astonishment. He sees no alternative to nuclear energy except disaster. Whether man can learn to live with fission is for Weinberg a basic philosophical question—"maybe," he says, "*the* basic philosophical question."

By Desmond Smith

The newsreels of yesterday had kwaziest stunts

Lights dimmed, popcorn bags rustled. . .presto! There was Wimbledon tennis, Paris fashion, the Atlantic fleet and performing chimpanzees

Norman Alley flying to Shanghai on Pan Am's China Clipper, 11 days by way of Honolulu, Wake Island and Singapore, to cover the war in China. . . . René Brut of Pathé News (who needed about ten seconds in the midst of fire, flood or battle to load his camera with 35-millimeter film) taking a chance on a broken bridge so that he could reach Madrid before Franco. . . . MGM's Gaston Madrieu riding around German-occupied Paris on his bicycle with a basket on the handlebars, camera hidden amongst half a dozen wine bottles (bottles because they would avoid suspicion if the sun glinted on the camera lens). . . . Such was the newsreelman's life before the newsreels surrendered to television.

Cameramen daily risked their necks bringing wars, fires, explosions, shoot-outs and nonsense to the screen. For this they earned an average of $150 a week and generous expenses (legend has it that it was a newsreelman who submitted an expense account that was marked: "Gratuity to admiral for bringing fleet closer inshore.")

In the golden age of the newsreels they were a noisy, likable, devil-may-care mob of individual operators, although they frequently hunted in packs, each answerable only to a newsreel company that took scant notice of his ethics so long as he got the pictures and delivered them on time.

Movietone was the largest of the newsreel organizations; Universal was the low-budget baby of the group, dubbed the "Five-Cent Weekly" by the other reels.

Mary Rizzo, a New York toe dancer, proves she can stop traffic along a mile of Broadway.

The beginnings of sound in 1929 killed off some early news film competition such as Kinograms. Universal claimed to be the first to hire a commentator, Graham McNamee, and the other reels quickly followed suit, dropping title cards in favor of a "talking reporter." Among the more famous were Lowell Thomas, Harry Vonzell of Pathé, "Thundering Ed" Thorgersen, Ed Herlihy, George Putnam and the comic Lew Lehr with his "Monkeys is the kwaziest people," an idiotic gag line that usually accompanied some staged event starring a troupe of trained chimpanzees. Paul Douglas was one narrator who eventually left the newsreels to star in feature pictures.

Newsreel commentators—former actors or radio personalities—seldom wrote their own material, and were not reporters at all. Around newsreel offices they were called "talk-strippers" and their prestige was minimal.

The reels were made up on Mondays and Wednesdays to coincide with the program changes at theaters around the country, and the prints were shipped by fast trains. Each newsreel carried between five and ten items: The reels had an average running time of

Mom comes along as chaperone, and Universal's cameraman is grinding away for posterity.

about nine minutes. Pathé tended to run the most sports, but otherwise the competitors were much alike. Big movie houses, like New York's Radio City Music Hall, would buy several, cut out duplications and edit the remainder together to be shown as the theater's own newsreel. By the late 1930s there were also many "newsreel theaters" that showed nothing but newsreels and short subjects.

At their height, an estimated 40 million Americans saw newsreels each week, whether they liked them or not. Theater managers considered the newsreel an intermission, during which patrons changed seats, went to the rest rooms, or bought buttered popcorn in the lobby. The content of the reels reflected Hollywood's perception of what these 40 million viewers wanted—spring floods, airplane crack-ups, million-dollar fires, apple-pie festivals, cherry festivals, pecan festivals and society weddings.

In the Thirties, most people paid their 25 cents for escapism, not to see newsreels of themselves standing in breadlines. So the newsreel image of America during the Depression was a land of bathing-beauty contests, midget-car racing, fashion shows (usually to the accompaniment of a dance band), monkeys, football games and battleships proceeding in line. On the rare occasions when shots of the Depression were shown, the social crisis tended to be treated as a joke. In a Movietone newsreel of 1935, for example, there is a harrowing sequence of pictures that shows a sharecropper family struggling to start a Model T truck in the face of a blinding Colorado dust storm. The commentator indicates amusement: ". . . . Pop the pig in the truck and off we go. Whoa! Where's Grandma?"

At the turn of the century, hundreds of thousands of Americans got their first visual news of the outside world from a movie seat. The lights went down, the pianist struck up a patriotic song, and "Edison" or "Biograph Pictures" flashed on the screen with parades, wars, fires and national figures packaged into brief one-minute movies: "Tearing down the Spanish flag," "The campaign in Cuba," "McKinley's inauguration" and "The destruction of the Standard Oil Company plant at Bayonne" (1900). As early as 1908 there were nearly ten thousand nickelodeons across the nation. Their fancy names spelled out in electric lights: "JEWEL," "ELECTRIC," "PICTORIUM," "BIJOU," "DREAMLAND."

Leslie's Weekly reported glowingly the progress of newsreels in the issue of January 6, 1900: "The American Biograph is taking a prominent part in the two wars now occupying the center of the world's stage. . . . A written description is always the point of view of the correspondent, but the Biograph camera does not lie, and we form our judgment of this and that as we watch the magic of the screen."

The Biograph camera did, of course, do plenty of lying. The demand for war scenes encouraged fakery, and many war scenes listed in the Edison catalog that were sold as genuine reports from the Spanish-American war were, in fact, staged and filmed in the rolling New Jersey hills near the Edison studios. The impulse to stage news was to surface again and again as the industry expanded.

It was a Frenchman, Charles Pathé, who first had the idea of editing together several news stories and winding them around a single reel. Pathé showed his first "newsreel" in Paris in 1909 and in London in 1910. *The Animated Gazette* included a sculling contest, a strike of factory girls and Queen Alexandra leaving for a visit to Italy. For a time, Pathé actually sold his news by the running foot.

Newsreels were at least as popular as such one-reelers as *The Servant Girl Problem* and *Escape from Sing-Sing*. The situation changed drastically after

The author is the television director at Montreal's CBC station. Knopf has just published Smith's Moscow.

1912, when names like Mary Pickford and Douglas Fairbanks began to mean something at the box office. The once-a-week newsreels, shipped by rail from New York or Chicago, were mainly made up of stale news. It was an age of ever more spectacular movies. The success of such epics as *Quo Vadis* and *The Last Days of Pompeii* convinced theater owners that although features cost more to rent than shorts or newsreels, they earned far more profit.

Hollywood competition forced pioneer East Coast news film companies to search for the kind of "news" that would appeal at the box office. Payments for exclusive rights to major news events began at an early date. On January 3, 1914, at Juarez, Mexico, Pancho Villa signed a contract giving Mutual Films of New York the screen rights to his guerrilla war. The contract granted him, in addition to a share of gross earnings, $25,000. Villa carried out his agreement to the fullest. When he was all set to attack Ojinaga, the camera crew had not yet arrived. He obligingly delayed his offensive until the cameras had been set up. As per agreement, his attacks were timed for daylight, and arranged to give the cameramen the best angles.

To be fair, cumbersome camera equipment was partly to blame for the fakeries. Leon Franconi, Pathé's first American manager, recalled in the *New York Times:* "Even if I could have found a cameraman with a nose for news, it would have been impossible for him to get lively action pictures, working with a monster camera and a tripod that weighed more than 100 pounds." But cut-throat competition was the major factor. A staged news event was an "exclusive." Pathé was perhaps the first newsreel to create its own news. On one occasion it hired a man to jump from the torch of the Statue of Liberty with a parachute. The jump was made with four cameras trained on the scene, each shooting from a different angle. The parachute didn't open until the stuntman was a third of the way down, and the stuntman was crippled for months. But audiences were delighted. Pathé also hired a motorcyclist to race the Twentieth Century Limited—then the fastest train in America. As the train rounded a curve the motorcyclist rode onto the ties. When he passed the last camera he turned off the tracks, zoomed up an embankment at 80 miles an hour and was almost killed. It was not news, but it satisfied the demands of exhibitors for more show-business excitement in the newsreels.

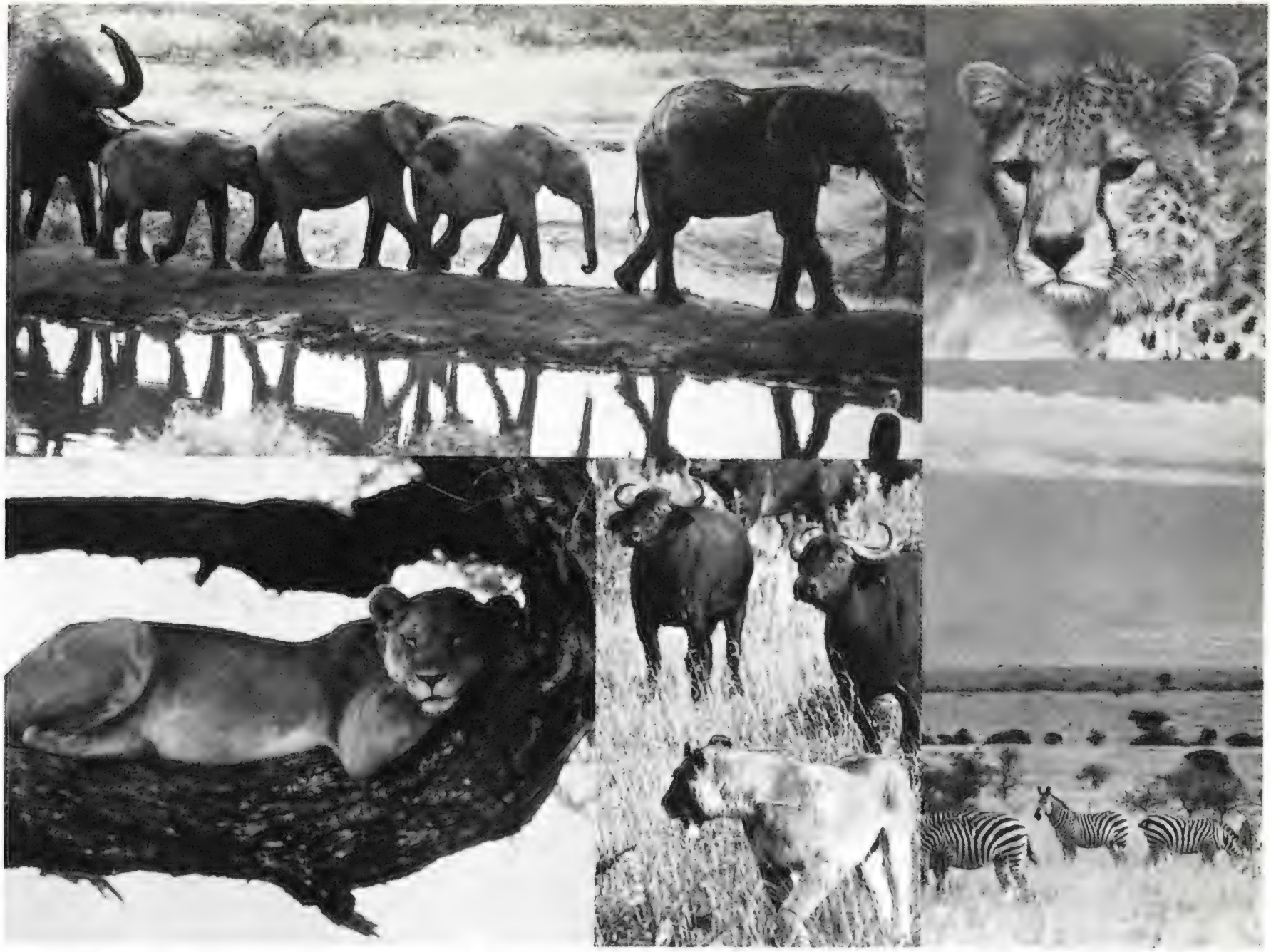
The outbreak of war in Europe in 1914 was made to order for the newsreel companies, hard pressed by the surging popularity of feature-length dramas and comedies. The war promised to rekindle interest in newsreels. But if Americans thought that the newsreels would play news straight, they were mistaken.

Following the example of President Wilson, the American people at first adopted a firm antiwar stand. But long-winded pacifist speeches and rallies on behalf of the Church Peace League were pretty poor box office. Much better were such feature-length documentaries as *The Kaiser Challenges, England's Menace, Germania* and *The Battling British.* Battle scenes (chiefly faked or reenacted) were enormously popular, also the bloody aftermath of trench warfare, aerial bombardment and so-called German atrocities. When we entered the war, both newsreel and still photographers were inhibited by the fact that only the U.S. Army Signal Corps cameras were allowed at the front.

Between the two wars several interesting innova-

A monkey getting a haircut at a beauty culture convention? That called for a cameraman.

A show dog getting the works in a beauty parlor? That needed a subtitle: "Pedicure for Pedigreed Pups."



Kenya. You have to come this far to get this close to life.

There's a place in this world where life is still lived naturally.

Where you can come so close to Earth's creatures you can hear them breathe. Whether it's a family of lions asleep in the sun. Or thousands of zebra crossing the plains. Or a frightened gazelle running for its life.

It's a place where you can see, more clearly than anywhere else, how orderly Nature is. How delicate the balance.

And where you can come to understand your relationship to all living things.

That place is Kenya.

Alitalia can take you there with a variety of tours. They include exciting safaris through the great game parks of East Africa, as well as visits to the Seychelles Islands in the Indian Ocean. The beautiful beaches of the Seychelles are perfect for relaxing after game-viewing.

You'll also visit Victoria Falls, one of the great wonders of the world; South Africa, including Capetown and Johannesburg; and South America with fabulous Rio de Janeiro as your starting point.

These luxury tours are a touch of civilization in the wild. The accommodations are as comfortable as any you'd find in the United States. And the food is superb. Which comes as a surprise to most people.

The prices are civilized, too. In fact, they're lower than anyone else's comparable tours.

Here's another surprise. Even in the summer, the temperature range in Kenya is 75°-85°F. And it's dry. And since it's like that all year round, any time is the perfect time of year for safari.

Experience Africa with Alitalia this summer.

You'll learn some facts of life you never dreamed of.

KENYA

Alitalia Tour Department
Africa Program
666 Fifth Ave., N.Y. 10019

Gentlemen
I want to get close to life. Please send me information on your tours to Africa

SN 5/75

Name

Address

City

State Zip

Newsreels loved Col. and Mrs. Lindbergh (invariably "Lindy and Anne"). The feeling was not mutual.

tions were introduced, but the journalistic standards of newsreels never rose far above those of the comic strips. Civilization apparently ended at the Statue of Liberty. All foreigners were considered funny, with the single exception of the British royal family. Mussolini and Hitler were rarely seen, thanks to a gentleman's agreement among theater owners fearful of fistfights in the audience. Frenchmen were called Froggies, and even as late as 1960 Pathé was describing Italian soccer players as "acrobats from Spaghettiland."

Famed picture by "Newsreel Wong" Hai-Sheng of piteous Chinese baby after Japanese bombing attack was a classic set-up. Preceding frames, omitted, showed child being placed amid debris between rails.

At home, ordinary Americans seldom made the newsreels except as sweepstake winners, giant pumpkin growers, flagpole sitters or dance-marathon champions. Women, known to the newsreels as "little women," "dolls," or "super charmers," appeared only in beauty contests, modeling in fashion shows or clinging, a dozen at a time, to a rope at the end of a Chris-Craft in Florida. The indefatigable Mrs. Roosevelt was an exception, but she seems to have been filmed from the point of view of novelty—she was as likely to spend her day in the depths of a coal mine as at a White House reception.

Somewhere, in the 40 years of newsreels that followed World War I, you might find an item about black Americans—but you would have to search hard. Fear of boycott by theater owners limited producers to news of lynchings and outright racist pandering—blacks having watermelon-eating contests, or having golf balls teed off their lips.

As for news of strikebreaking, suppression of the labor movement, maintenance of child labor, and vast unemployment, there was little or no coverage. In 1934, when Upton Sinclair ran for the California governorship, several newsreels showed an army of unemployed men pouring into the state on freight trains, expressing a desire to live off the government if Sinclair won. The scenes had been staged. And in 1937, all prints of the Republic Steel Corporation massacre in Chicago were temporarily shelved. Paramount News had filmed the action as hundreds of strikers were shot down by Chicago policemen, but, according to *Time,* "decided not to release it on the grounds that such an unrelieved record of blood and brutality was liable to touch off more riots." This was the same

Thomas Edison, center, posed on his 83rd birthday with cronies Henry Ford, left, and Harvey Firestone.

Cameras seldom missed Babe Ruth signing for another season with Yankees' owner, Col. Jacob Ruppert.

newsreel company which had no qualms about showing earlier Cuban atrocities nor about releasing ghastly scenes of Japanese atrocities in China within a few months. The sequence was finally released after Senator Robert La Follette jr., of the Senate Civil Liberties Committee, subpoenaed it. It was run widely throughout the United States, except in Chicago, where the police banned it as "unfit for women and children to see."

Cameramen were seldom sent out on assigned stories, but rather developed their own. And when they were confronted with an individual and not a blazing fire, they usually simply recorded what the subject had to say and shipped the film. As part of a series on distinguished people, Fox Movietone located John D. Rockefeller at his $800,000 estate in Ormond Beach, Florida. At the end of the sequence, in an unforgettable non sequitur, Rockefeller turned to the camera and said "God Bless Standard Oil."

In December 1937, the U.S. gunboat *Panay* was attacked by Japanese bombers in Chinese waters. It happened that there were two newsreel cameramen (Eric Mayell and Norman Alley) aboard. Movietone and Universal News filmed every aspect of what soon became an international "incident." The Navy placed four destroyers at the service of the newsreel companies for a record-breaking ten-day dash from Shanghai to Manila. Soon after, American audiences sat mute and wide-eyed watching American sailors wounded in combat, and alien waters closing over an American ship as it sank to the bottom of the Yangtze River.

About the scenes recorded, newsreel union official Herbert Aller later wrote: "Disregarding their personal safety, concentrating on doing their job in hand well, they ably took pictures of an incident that shocked the world, illustrating how the *Panay* was bombed, fired upon, what occurred during the bombardment, the scramble to shore, how the victims fled for safety . . . through the marshes and swamplands."

After 1938 there hardly seemed a week without some mention of the Navy in one newsreel or another. An emphasis on rearmament led to the playing up of war news from China. In retrospect, China was the perfect newsreel war: long on action and short on explanation. Newsreelmen concentrated on Japanese atrocities. Overall, coverage of the Chinese war was considered one of the newsreels' better jobs. The war was seen as a remarkable display of what international industry and technology could do. It was filmed in terms of bombers versus antiaircraft guns, tanks versus field artillery. The Chinese people were merely an unfortunate backdrop. As one commentator put it at the time: "In Shanghai when a Jap bomb landed behind the International Hotel, it was as though something had stirred a vast ant heap releasing a hoard of yellow ants."

When World War II arrived the nation was again divided in its sentiments. In the East, theater managers advertised "The Latest War News" on the marquee. But in the Midwest, where isolationism was the prevailing mood, owners practiced scissors censorship and announced *NO WAR NEWS SHOWN HERE.* After Pearl Harbor the newsreels became the trumpets of "total victory." The Telenews theater chain advertised: "Identify a relative in the newsreels and receive a free enlarged photo taken from the film." Newsreel editors were urged to select shorts which showed the greatest number of American troops. Generally ab-

sent were scenes showing black G.I.s. At one point, the War Department was accused by one black organization of turning over all scenes showing black troops to All American Newsreel, a company catering exclusively to black theaters.

Relatively little of the film shot during World War II was filmed by the newsreel companies. Combat photography was chiefly the prerogative of the armed forces. When the newsreelmen came home from the war they found their neighbors talking about a new form of entertainment—television. At first the competition didn't seem too serious: In 1946, about as many homes had television sets as had newborn triplets. But by the end of 1950 there were 9 million TV homes; the next year 15 million, then 20 million, and as television expanded, theater attendance slumped. The movie houses in which the newsreels were shown dwindled, because managers found it more profitable to schedule an intermission.

Of the five major newsreel companies, Warner Bros. (which had bought the name and film library of Charles Pathé) was the first to go, in 1956. A year later, Paramount News ("The Eyes and Ears of the World") folded; its library, 10 million feet of film dating from 1928, was later sold to a TV film distributor. Movietone News stopped producing newsreels for the United States in 1963. MGM-Hearst "News of the Day" distributed its final U. S. reels in 1967, and Universal News called it "The End" the same year.

With all their fakeries, their slants, their gaucheries, newsreels put many an unforgettable moment on film. During the 1929 crash, a bankrupt broker was shown plunging to his death from a Manhattan office building. Newsreel cameras recorded the burning of the *Morro Castle,* filming the panic and death of passengers as they fell into the furnace of the ship or drowned in the water. Newsreels have President McKinley leaving office after his first term (Universal bought it from Vitagraph, whose photographer, awestruck by the event, turned his crank too fast and made it a slow-motion picture); Czar Nicholas reviewing his troops in 1914; President Taft making his inaugural address in a snowstorm; Teddy Roosevelt hunting in Africa; Wilson introducing the use of automobiles in inaugurations; Lloyd George, Poincaré, Clemenceau and Wilson at the Versailles Peace Conference; Byrd flying over both Poles; Lindbergh in Paris; Hauptmann on the witness stand; Dillinger on a slab; Jack Johnson, Jack Dempsey, Joe Louis, Paavo Nurmi, Hitler, Mussolini (eventually), Stalin, F. D. Roosevelt, Truman and countless others.

And then there was that steamy August afternoon in 1927, when a newsreel cameraman hung from the dome of New York's Municipal Building and "shot" a lovely blonde taking a bath in a tub suspended from a blimp. Four times he nearly lost his balance. Twice lightning flared within inches of his head. Once the wind-buffeted blimp drifted so close that he was nearly nudged off.

Some hours later, back at the office, the yarn goes, he ran off the blimp-and-tub footage for the boss.

"Is that all you've got? What have you been doing all day? Where the hell are the endless streams of trucks and trains? Where's the ballet girls, the spinning factory bobbins, the belching issue of the steel furnace, the timeless arabesques of the riverboats' plunging pistons?"

"Aw," the crestfallen cameraman answered, "Today I've got bad corns."

And that was the way it was when the newsreels were young.

Golf and gadgets were popular, so "Iron Bobby" (named for Bobby Jones) was a natural. It taught tyros.

IBM Reports

The computer and research

The computer serves society in many ways. It is an information organizer, helping deal with large amounts of data. It is a productivity tool, helping us make better use of our resources. It is a management tool, providing perspective on complex decisions.

The computer is also a major research tool, perhaps the most useful of any at the disposal of science today. It is being used to explore many different frontiers of the natural world mathematically—recreating and analyzing interactions that could not otherwise be observed or understood.

It is helping scientists develop a mathematical model of the nucleus of a human cell for use in cancer research. It is helping develop potential new energy sources such as the fusion reactor. It is helping weather researchers learn how to control air pollution.

In these and countless other activities, the computer is performing calculations that were often impractical, or even impossible, only a few short years ago—calculations that have now been made practical by rapid advances in computing speeds and storage capacity, and sharply reduced cost-per-computation.

It's particularly appropriate that the computer should play such an important role in scientific research, for research has played a key role in the computer's own development. A prime example is the remarkable evolution in the basic components of the computer—from the early technology based on large, relatively slow vacuum tubes, to transistors, to integrated circuits, to today's microscopically small high-speed circuitry.

IBM research scientists made critical contributions to these advances. Now they are helping look for the breakthroughs of tomorrow—exploring new techniques ranging from sophisticated lasers to devices much faster than even the most advanced circuitry now in use.

IBM's commitment to research, to finding new ways to do things better and to reducing the cost of doing them, is a continuing one. And it is a cornerstone of our expectation that the technological strides of the next twenty-five years will eclipse even those of the last twenty-five.

We are working toward that goal.

IBM

A Depression eviction produced this footage with the usual cheery comment about life going merrily on.

Publicity shot of famed newsreel cameraman Joe Gibson suggests perils of being "on location."

Travel Benefits for Smithsonian Associates

With the growth of the Smithsonian Associates, the Institution is striving to meet the needs of its membership by offering a varied travel program. Traditionally, Foreign Study tours provided culturally oriented, first-class, specialized trips under the guidance of museum curators or experts in respective fields. Then, Domestic Study tours were added to offer similar opportunities within the United States, thus allowing Associates and their families a chance to combine vacation with a period of study. Last Fall, Foreign Charter tours were introduced; these trips are larger, lower-cost and more generalized in nature. Last month we were pleased to announce a new category of travel sponsored by the Division of Performing Arts in cooperation with United Buying Service. These tours are also low-cost, but they are specifically tailored for Associates wanting to concentrate on the performing arts, with an emphasis on the London theater. Travel benefits are announced exclusively in SMITHSONIAN. For information on a specific tour, write addresses below.

Domestic Study Tours

Lincoln Heritage Trail—June 7-14: Trace the history of the Lincoln family from Lexington, Kentucky, to Springfield, Illinois • **Quebec**—June 21-28: French culture in Montreal and Quebec City • **Williamsburg**—June 27-29: A weekend planned especially for families with children of elementary school age • **Colorado River Float**—July 2-10: A raft trip down the Colorado; camping on the banks and study of the fascinating geology of the canyon • **Iceland and Faroe Islands**—August 9-23: A trip through Iceland to the Westman and Faroe Islands • **Massachusetts**—August 9-16: Boston, Deerfield, Sturbridge Village and New Bedford, highlighted by the Berkshire Music Festival • **Williamsburg**—September 3-7: A return to Colonial days, with accommodations at the Williamsburg Inn • **Pacific Northwest**—September 6-16: Spectacular forests and national parks; side trips to the San Juan Islands and Victoria • **Chesapeake Bay**—September 20-27: Bay history and ecology with stops at Oxford, St. Michaels and Baltimore • **All About Gems Weekend**—October 24-26: Dinner in the Hall of Gems; meetings with curators and staff; a special tour of the gem and mineral collections • **Washington "Anytime" Weekend:** Choose any weekend to visit the nation's capital and enjoy a special tour of the original Smithsonian building, two nights at the elegant Loew's L'Enfant Plaza Hotel, close by, and a chance to see other sites in Washington (all-inclusive price is $59.95 per person based on double occupancy) • Write Domestic Study Tours, Room 1270B A & I, Smithsonian Institution, Washington, D.C. 20560.

Foreign Study Tours

Classical Greece—June 10-July 2: Archaeological sites in central Greece and the Peloponnesus • **Copenhagen to Lisbon**—August 23-September 14: Art and architecture cruise aboard the *Argonaut* to celebrate "European Architectural Heritage Year" • **Russia**—September 22-October 4: Art and architecture • **Hawaiian Islands**—November 8-21: Petroglyphs and natural history • Write Miss Bliss Schumann, Foreign Study Tours, SI 123, Smithsonian Institution, Washington, D.C. 20560.

Foreign Charter Tours

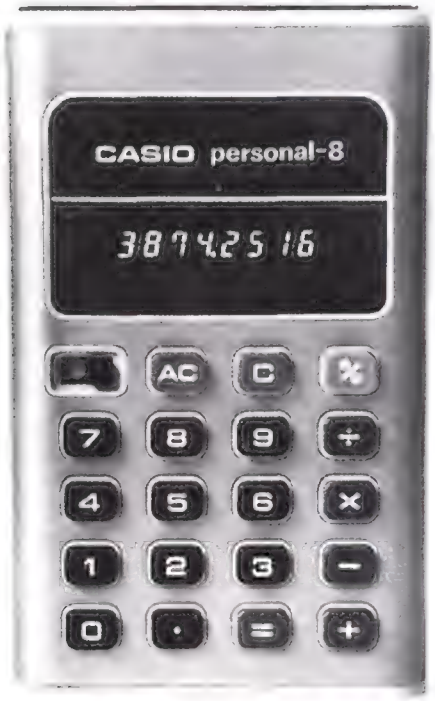
Great Britain—September 25-October 9: (waiting list only) The National Gallery, Tate, Victoria and Albert with expert guides; walking tours of literary London in search of Shakespeare and Dickens; springtime excursions into the countryside; the best of London theater and performing arts; a look at the modern city • Write Robert Angle, 900 Jefferson Drive, Smithsonian Institution, Washington, D.C. 20560.

Performing Arts Tours

London Theater—July 5-19 or August 2-15: Comprehensive theater tours, led by Dr. Howard Richardson, author of more than 40 plays, include seven performances, backstage visits, seminars; low cost covers round-trip air fare from Washington, first-class hotel with breakfast, and theater tickets. Write Mark Mason, Division of Performing Arts, Smithsonian Institution, Washington, D.C. 20560.

Smithsonian Commons Now Open on Weekends
As a result of its overwhelming popularity, the Smithsonian Commons is now open on weekends for Associates and their families. Located in the original Castle building, the Commons offers a buffet luncheon entrée for a fixed price of $3.25, with a reduced rate for children. Beverages and desserts are optional. The Reception Center and the elegant Smithsonian Commons dining area provide a place for Associates to obtain information and lunch in a relaxed setting while visiting the national museums on the Mall. Hours are 11:15 A.M. to 2:15 P.M., seven days a week. An Associates' card is required.

An 8 digit, 5 function calculator at a low 4 digit price. $29.95.



It's the new Personal-8. From Casio, the world's largest calculator manufacturer. It adds, subtracts, multiplies and divides—instantly—and has a % key, for one-touch figuring of mark-ups and discounts. It displays answers and entries on a large, bright green, 8-digit read-out. Plus, you get chain, mixed and constant calculations. A full floating decimal. A squaring system. And more. All in a handsome, polished metal and styrene case that fits in your pocket.

Free $5 AC Adaptor.
Works on AC Adaptor or 2 penlight batteries, all included. Casio's New Personal-8, compliments of Jonathan Post. Order today for Father's Day or Graduation Day.

1 Year Warranty/15 Day Trial Offer! (If not fully satisfied, return within 15 days for an immediate refund.)

Jonathan Post SM 55
637 South Dearborn, Chicago, Ill. 60605

Enclosed please find $32.45 ($2.50 for shipping and handling) for the Casio Personal-8.

☐ Check Enclosed ☐ BankAmericard
☐ Master Charge ☐ Diners Club

(Master Charge Bank No. _____)
Card No. _____
Expiration Date _____
Name _____
Address _____
City _____
State _____ Zip _____
Signature _____

Illinois residents add 5% © 1975 by Jonathan Post™

Book reviews

Hazor: The Rediscovery of a Great Citadel of the Bible
Yigael Yadin
(Random House, $20)

Years ago, when the Middle East was in one of its quiet phases, Israel's then Premier David Ben-Gurion was flown to see the results of four separate but coordinated archaeological expeditions in the canyons of the Judean Wilderness.

At each of the first three sites the finds, hundreds of them, were spread out on the ground, and each team leader dryly discoursed on them.

The fourth team's leader used a different technique. He escorted his guests into his tent office, there brought out his treasures one by one, and talked of them forcefully, one by one.

Casually, at one point, he mentioned a discovery found that very day and as yet wound in its ancient packing. Would the visitors, he asked innocently, like him to unwrap it now?

That team leader was Yigael Yadin, today perhaps Israel's most widely known archaeologist, and his performance was a magnificent piece of showmanship.

He is, at the same time, a scrupulous scholar. His expeditions are organized and carried out with all the precision that goes with a first-rate military mind; Yadin was once Israel's Army Chief of Staff. His conclusions usually are cautious. His latest book, on the great Biblical city of Hazor in Galilee, illustrates the two sides of Yadin's personality.

It is a lovely book, lovingly designed. There is hardly a page without effective illustrations. Some of the close-up photographs of the discoveries—gods and altars, a carved incense ladle and an ivory spoon, a tiny bronze bull and a giant stone lion in relief—are breathtaking.

As a writer Yadin is best known for the report on his definitive dig at Masada, the tabletop mountain overlooking the Dead Sea. But Masada was important for a brief moment—in archaeological terms—of less than a hundred years, from the time Herod the Great built a palace there until the day a small group of Hebrew zealots committed mass suicide rather than surrender to the besieging Romans.

Hazor lacks the simplicity, the unity, the natural drama—the glamor, if you will—of Masada. Hazor is a complex site with, Yadin found, 21 strata of settlement, from the early Bronze Age to the Hellenistic. Records of the time—clay tablets from Mari, Egyptian documents—indicate that Hazor must have been a flourishing, powerful city at its height. The Book of Joshua describes Hazor as once "the head of all those kingdoms"—of northern Canaan—and reports that Joshua, while sparing other enemy cities, burned Hazor to the ground.

In five seasons of digging Yadin set out to confirm or refute the ancient words and to learn more. Much of the book deals with the unraveling of mysteries and reads like a scientific detective story.

A prime example: Hazor consisted in part of the standard tell, the distinctive, flat-topped hillock created through centuries of building, destruction and rebuilding on the same strategic or otherwise attractive spot. But there was an unusual and unexplained addition to the site: A 200-acre plateau, itself protected by huge earthen ramparts, stood north of the tell.

An accepted theory was that this enclosure, vast by the standards of the time,

Hazor: A little bull of wrought bronze

1925, A FRAGRANCE CAPTURES THE WORLD LIKE LE JAZZ HOT.

A transmuted sadness pours forth from jazz trumpets. The rhythms are compelling. It is The Jazz Age, and Guerlain creates a perfume of real power.

Shalimar. Heady, exciting, as intoxicating as Prohibition itself.

SHALIMAR
by Guerlain

Crispina found a friend

One who is helping her survive

Crispina Aguilar's case is typical.

Her father works long hours as a sharecropper despite a chronic pulmonary condition that saps his strength. Her mother takes in washing whenever she can. Until recently, the total income of this family of six was about $13.00 a month. Small wonder that they were forced to subsist on a diet of unpolished rice, swamp cabbage, and tiny fish the children seine from a nearby river.

Now Crispina enjoys the support of a Foster Parent in Tennessee whose contribution of sixteen dollars a month assures Crispina and her entire family of better food and health care. And, when Crispina is old enough, the help of her Foster Parent will give her a chance for an education, an opportunity to realize whatever potential she has to offer to this world.

How can such a small monthly contribution do so much in the life of Crispina's family? In the underdeveloped countries where Foster Parents Plan is at work, the need is so great, the poverty so deep, that very few dollars can make a tremendous difference. In fact, with PLAN programs and services in place, the very communities where Foster Children live are aided toward self-improvement.

To become a Foster Parent is a special responsibility . . . and a most rewarding one. You become an influence in shaping the life of your Foster Child. You come to know the child through photos and a regular exchange of letters. Progress reports show you vividly how much good your contribution is doing. Of the many fine causes that ask for your support, few can offer you such a tangible and immediate way to help others.

Today, more than ever, people like you are needed to join in this wonderful work. Hundreds of children wait in desperate, often shocking, circumstances for a Foster Parent to offer them a hand toward a decent life.

Please join us if you can . . . or let us send you more details about how PLAN is working around the world.

SM-X-5005

FOSTER PARENTS PLAN, Inc.

Box 403, Warwick, Rhode Island 02886

YES, I would like to know more about becoming a Foster Parent.
Please send me the full facts ☐.
I am ready now to become a Foster Parent to a boy ☐ girl ☐ age
country _____ or whoever you feel needs me most ☐.
Please send a photo and case history of the Foster Child. Enclosed is my first contribution ☐ $16 monthly, ☐ $48 quarterly, ☐ $192 annually.
I can't become a Foster Parent now. I enclose a gift of $_____.

NAME _____

ADDRESS _____ DATE _____

CITY _____ STATE _____ ZIP _____

In Canada, write 153 St. Clair Ave. West, Toronto, Ontario M4V 1P8

PLAN operates in Bolivia, Brazil, Colombia, Ecuador, Peru, Indonesia, Korea, Haiti, Viet Nam, and the Philippines. PLAN is registered with the U.S. State Department Advisory Committee on Voluntary Foreign Aid. All contributions are tax deductible. Foster Parents Plan, Inc. is a non-political, non-profit, non-sectarian, independent relief organization.

had been a fortified camp guarding the city. Yadin was skeptical and began his excavations in the enclosure, revealing that it was actually another city, with "huge, strong fortifications and all the trimmings" and a population of up to 50,000. It was complete with sewers and canals, a pottery workshop and cisterns.

Within this lower city Yadin's diggers uncovered graphic symbols of worship—a sanctuary apparently to the moon god, an altar made of a single five-ton stone, a temple containing a "holy of holies." That temple was found under charred beams and a fallen roof, indications of Joshua's fiery work and a clue to the dating of Joshua's conquests.

The lower city never revived after Joshua destroyed it. But on the tell itself, the upper city, Yadin found evidence of a Solomonic gate, of a citadel built by the unfortunate Ahab, husband of Jezebel, of an earthquake described by the prophet Amos, of a siege-defying Israelite water system, of the wealth of the Israelite city on the eve of Assyrian ruin and its sad straying from Yahweh to Baal and Astarte.

Yadin can be excused his occasional outbursts of exuberant words and other minor lapses. It is given to few to uncover the Biblical past with such thoroughness and to add such vivid detail to our knowledge of Canaanite and Hebrew culture.
—Alvin Rosenfeld
Free-lance writer, formerly NBC News bureau chief in Israel

Whitetail Deer: A Year's Cycle
Curtis K. Stadtfeld
(The Dial Press, $7.95)

This is a thorough, realistic, and superbly written description of the ecology and behavior of the whitetail deer. Following a doe through a typical year in its life, the book provides a fascinating account of the life cycle of this animal. The author points out that it is not known why bucks grow antlers, or what purpose these "ornaments" serve. When bucks normally fight, they push with their heads, rather than using the antlers for slashing or fencing; nor do the antlers seem to be of much use in fighting other animals. Stadtfeld concludes that "they are a function of the breeding season, an extension of the male sex organs, and there is much more about them no one knows."

In feeding, deer seem to try not to destroy the food source, but rather to

THIS SHOULD TELL YOU SOMETHING.

A Steinway piano represents a considerable investment when you buy it new.

What this should tell you is that your considerable investment is a good investment.

It should tell you that the Steinway piano you buy is still the most sought-after instrument of its kind.

It should tell you that in matters of tone and touch, of sound and subtlety, Steinway® stands alone.

It should tell you that the Steinway you choose is not an extravagance–that in fact it is almost surely less expensive to own, in the long run, than a cheaper piano.

It should tell you once and for all that in picking a piano you have only one choice.

Steinway vs. everything else.

For information write to John H. Steinway, 109 West 57th Street, New York 10019.

STEINWAY & SONS

HANDCRAFTED HEIRLOOMS

Your family will enjoy a handcrafted mantel clock for generations to come

SOLID WALNUT
MANTEL CLOCKS

8-Step Hand-Finished Genuine Black Walnut Cases • Solid Brass Dials • Westminster Quarter-Hour Chiming, Hour Striking • 8-Day Brass Movements • Exclusive 4-Jeweled Escapements for Accuracy

Send 50¢ for Beautiful Full-Color Catalogs featuring all hobby and decorator clocks, tables, gun racks, shelves, rocking stools and kits.

CLIP AND MAIL TODAY!

Crown of Fairhope

P.O. Drawer G-92, Fairhope, Alabama 36532

Major Credit Cards Accepted

Please send me your beautiful Full-Color Catalogs on all your fine products. Enclosed is 50¢ to cover postage and handling. (please print)

Name _____

Address _____

City _____

State _____ Zip _____

VISIT OUR FACTORY SHOWROOM.

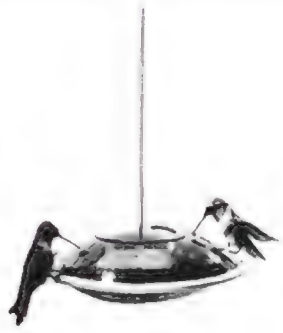
AMERICA'S FINEST MANTEL CLOCKS AT FACTORY PRICES

FLEMING COLLEGE

American, two-year (A.A. degree), co-educational college based in Florence, Italy. Courses in Fine and Studio Arts, Music, Archaeology, English, Literature, History, Political Economy, Philosophy, Languages, Sciences, Theatre Arts, Film, Photography. Outstanding faculty, two-week stay in Italian homes, and research trips throughout Italy offer students an excellent liberal education with an international dimension. Interim pre-college year available. Residence on or off campus.

Contact: N.Y. Rgtr.,
326 East 69th Street,
New York, N.Y. 10021.
Tel: (212) 988-5462.

DROLL YANKEES HUMMINGBIRD FEEDER has 3 feeding stations, a three year guarantee, and is simple, strong & easy to clean. $8.25 postpaid. Write for free catalog of our bird feeders & bird song phonorecords.



DROLL YANKEES® INC., Box 98-S
Foster, Rhode Island 02825
Telephone orders: 401/647-2727

The no-compromise vacation. The only place you cut corners is on the cost.

We'd like to help you spend less money for your vacation this year. Without getting less vacation for your money.

So we've put together what's probably the most helpful vacation planning guide in America. It's full of facts about things you can do here. And you'll be surprised how many of them are free.

Even the Trip Kit is free. Just send us the coupon.

And find out how far your vacation dollar can take you.

Name _____ Address _____

City _____ State _____ Zip _____

Free South Carolina Trip Kit

Mail to South Carolina Division of Tourism, Room 846, Box 78, Columbia, South Carolina 29202.

"sample each plant lightly so it will not be harmed and will grow again so they may feed from it all summer and again next year." And, in avoiding dangers, the deer learns to listen for the caw of the crow, "for the crow joins the whitetail in its wariness of man, and often it is the alarmed call of the sentry crow from treetop or fencepost that first alerts the deer."

One refreshing aspect of the book is the author's frequently reiterated point that man, in fact, knows very little about this animal that he has spent so many decades, and so much money, studying.

The author is not troubled by man's ignorance of the deer, and he observes humbly that "we have been studying them seriously for only a hundred years or so, while they have been around for millions of years, and we should be prepared to wait a while for all the answers. It is useful to have respect for our elders."

But the book does have one major shortcoming: While it goes into great detail about almost every aspect of the deer's life cycle, it tells us almost nothing about the effect of hunting on the deer (see SMITHSONIAN, January 1974), and how this affects the structure of family groups and the evolution of the species. The author does point out that "old-timers—men now in their sixties and seventies—remember seeing long strings of deer, forty or fifty in a group, an old doe at the head with her descendants trailing along, three or four generations with their offspring. . . . Now they move in smaller groups, three or four or half a dozen. . . ." Has hunting, along with altered habitat, added to this change?

Drawing by Lydia Rosier from the book

In one section, the author describes a quick kill made by a .30-.30 rifle, and leaves the impression that deer shot by hunters die a quick death. No mention is made of the millions of deer each year that are wounded, maimed, crippled or orphaned by guns.

The author, himself a hunter, frequently makes the point that deer have to be hunted in order to prevent overpopulation and starvation, since man has largely eliminated their natural predators, such as wolves and cougars. In support of this, he provides a greatly oversimplified account of the famous Kaibab Plateau deer study. But what about the recent controversy over the Great Swamp National Wildlife Refuge in New Jersey, where preservationists stopped the refuge from being opened up to deer hunting several years ago? Despite warnings that the entire herd might perish if it were not "culled," the deer made it through that winter, and several subsequent ones, just fine. When the Interior Department opened up the refuge to hunting in late 1974, it was apparent that no large-scale die-offs had occurred, much less the predicted massive starvation.

The author seems to contradict himself, amid the constant allusions to the necessity of culling deer numbers, by noting, with apparent approval, that Michigan's Department of Natural Resources plans to increase the size of the state's deer herd from 400,000 to perhaps a million by 1980. How will this be done? By increasing Michigan's present bounty on coyotes? By clear-cutting more forests?

Nevertheless, *Whitetail Deer* is otherwise excellent. It is a thoughtful, eloquent and realistic account of one of America's most abundant mammals.
—*Lewis Regenstein,* executive vice president, The Fund For Animals; author of *The Politics of Extinction*

Prehistoric Art of Australia
Dacre Stubbs
(Scribner's, $17.50)

Art on the Rocks of Southern Africa
D. N. Lee and H. C. Woodhouse
(Scribner's, $15)

In 1840 one Joseph Bradshaw, prospecting for gold in the Kimberly region of northwest Australia, happened upon a shelf of red rock adorned with gaunt, dark, fading painted figures that he con-

austria 75

Austria is **music,** a harmony of man and nature that celebrates all life. This year, we mark the 150th anniversary of the birth of Johann Strauss in a year-long festival of joy. Join us during operetta weeks at Bad Ischl and Baden . . . for performances on the magnificent floating stages in Mörbisch on Lake Neusiedl and Bregenz on Lake Constance . . . at glorious new productions of **Die Fledermaus** and **A Night In Venice** . . . at a stunning **Gypsy Baron** . . . in Vienna, where a comprehensive exhibition in honor of Strauss awaits your eye . . . and Salzburg, the festival city, where music is as natural as air. Come feel the special magic of our beautiful land that inspired Haydn, Mozart, Beethoven, Schubert, Brahms and Schönberg. For information on excellent values in travel to Austria, ask your travel agent or rush the coupon below to the nearest Austrian National Tourist Office.

GC & Cie

Please send details on Austria '75

Name_____

Address_____

City_____ State_____ Zip_____

545 Fifth Ave., N.Y. 10017; 3440 Wilshire Blvd., Los Angeles, Cal. 90010; 200 E. Randolph, Chicago, Ill. 60601; 1007 N. W. 24th Ave., Portland, Ore. 97210.

Americana Rail Cruises®

old time carefree train travel is back again

On our rail cruises you'll visit the most exciting places on our continent and see all the spectacular scenery in between. Travel in air-conditioned sleeping-car accommodations aboard the famous Amtrak trains. Enjoy frequent stopovers at the best hotels and resorts, gourmet dining at famous restaurants, fiestas, parties and many other outstanding special features. Tours from 16 to 24 days.

Once you step aboard, you can forget about schedules and frantic baggage moves—your tour escort takes care of all the details.

All tours fully escorted. Inclusive price covers transportation, sightseeing, hotel accommodations, meals and tips.

Departs New York, Chicago, Philadelphia weekly April thru October.

For Four Winds Americana Rail Cruises brochure see your travel agent or mail coupon

- **Canadian Rockies/Northwest**
- **California/The West**
- **Navajolands/Canyonlands**
- **Mexico and the Deep South**
- **Eastern Canada/Nova Scotia**
- **Trans-Canada**
- **Florida in Depth**

Four Winds®

175 Fifth Avenue, New York, N.Y. 10010
Phone: 212-777-0260 R 741

Please send your 32-page, full-color Americana Rail Cruise brochure.

Name_____

Address_____

City_____ State_____ Zip_____

Hirmer Fotoarchiv München

A moment in the Carras Experience.

One picture of a votive relief from Melos doesn't give you Greek civilization. Because some things are so special they have to be felt. Experienced. You have to be there for them to happen.

Our purpose is to provide the conditions and opportunities for these unique moments. Starting July 26, 1975 our newly christened 100th Anniversary Celebration ship, m.t.s. Daphne, will sail on six remarkable voyages. To historic maritime capitals. To the 4,000-year-old palaces of Crete. To Homer's birthplace and the Blue Mosque. To native festivals, Vivaldi concerts and deserted beaches. Some will visit our own new resort, Porto Carras.

All of them will include the special freedom of doing absolutely nothing but enjoying every amenity of gracious relaxation aboard one of the most spacious ships afloat.

For a 36-page, full-color brochure describing our Experiences, please contact your travel agent or Carras. Reading it won't be the same as joining us. It will just make it very hard not to.

Carras

What can't be described must be experienced.

Carras, 630 Fifth Avenue, New York, N.Y. 10020, (212) 757-0761.
The m.t.s. Daphne, 17,000 gross tons, will sail under the flag of Greece.

sidered strange and rather Egyptian-looking. This discovery, some 40 years before the chance finding of the paleolithic paintings in the Altamira Cave in northern Spain and precisely a century before a 14-year-old French lad followed his dog through a hole in the ground into the marvelously painted cave of Lascaux, marked the inauspicious transformation into historical time of the prehistoric art of the Australian Aborigines.

The "Bradshaw" figures—for so they have become known—are the oldest paintings yet found on the Australian continent (though there are earlier rock engravings), and their meaning today is just about as elusive as it was 135 years ago to the uncomprehending prospector.

Even older Aborigines know nothing of their import. Nonetheless the "Bradshaws," like the other evidences of humankind's earliest art, continue to stimulate the most profound curiosity and respect.

Wandjina white-painted figure (detail)

Through the devices of the modern camera, each of these books is able to bring us closer, in a sense, to the remarkable Stone Age art of Australia and southern Africa. Stubbs, an author and photographer by profession, pursued Aboriginal art whenever he could find it in the vast Australian outback; Lee and Woodhouse, South African businessmen, pursued their hobby for more than a decade by crisscrossing southern Africa

to visit and photograph just about every known "gallery" of Stone Age mural art. In each case, the photographic results are exemplary and valuable to both specialists and laymen.

The subject of each book is the esthetic residue of Stone Age cultures that survived nearly intact until very close to the modern age. There are many similarities in the rock art of the two continents—a not unremarkable fact, considering the fundamental economic and technological similarities between the hunter-gatherer tribes responsible for the paintings. The differences, however, are remarkable.

There is nothing in southern Africa, for instance, that resembles the startling, large, white-painted Wandjina cult figures of northwestern Australia, paintings believed by Aborigines to have been left by their spirit-ancestors in their own version of prehistory, which they call "the Dreamtime." Nor is there anything similar to the famous "X-ray" art of the Aborigines of Arnhem Land in north-central Australia.

On the other side, Australian Stone Age art, in all of its diverse manifestations (and it should be noted that Stubbs' book deals not just with mural art but also with rock engravings, carved trees and bark paintings), reveals nothing so graceful and sophisticated as the stunning animals that populate the painted caves and rock shelters of southern Africa. These are the masterpieces of Bushman art, in which the painters demonstrate not only a marvelous feeling for color and flowing movement, but also a way of modeling their running eland, buffalo and zebras that gives a convincing, realistic, in-the-round impression of the graceful beasts.

It is always sobering, of course, to realize that the technology responsible for producing the cameras that made these books possible also victimized the complex cultures that produced the art the books so effectively record and celebrate. The Bushmen, for instance, painted their own demise in the early 19th century, when they were reduced to stealing cattle from the Bantu and the European settlements. The final Stone Age paintings show the offending tribesmen being hunted down and killed. Each of these excellent picture books is a sign, perhaps, that ours is a more enlightened age.

—Benjamin Forgey
Art and Architecture critic,
Washington Star

CLASSIFY YOUR OWN COLLECTION OF ARROWHEADS AND PROJECTILE POINTS

Big 8½ x 11-inch book shows you how. 50 full-size photographs of rare fluted points from North America. 31 figures, 30 tables, 3 full-page photographs. Many sketches and drawings of projectile points showing their primary characteristics. Traces evolution of spear, dart, and arrow. Atlatl test data, penetration tests, bow strength, arrow range, use of computer for classifying. 250 pages, top quality, including an LBI edition. Order NOW for first edition.

Book Prices		Classification Aids	
Soft Cover:	$14.50	30 x 40" chart:	$2.75
Cloth Cover:	$17.50	Worksheets (50):	$2.00
Buckram Edition:	$20.00	Binder (personalized):	$3.50
		Handbook:	$4.25

California residents add 6% sales tax.
Shipping: 80¢ per book and 30¢ per aid.

Send check or money order to:

Arrowhead Publishing Company
P. O. Box 1467
Garden Grove, California 92642

TRADITIONAL
CABLE CAR CLOTHIERS
ROBERT KIRK, Ltd.
San Francisco's British Goods Store Since 1939

Casual Six Pocket Lederhosen Style Walk Shorts $16

These handsome European style Lederhosen walk shorts by Rough Rider have been long time favourites for travel and warm weather. Authentic, rugged detailing includes 6 pockets . . . two in back, four in front, deep enough for a passport. In tan, light blue or bronze cotton corduroy. Also available in no-iron Dacron and cotton poplin in white, light blue or tan and in faded blue chambray cotton denim. Men's waist sizes 28 to 44. °Also, women's 8-20.

Mail Orders To: Lederhosen Shorts
Cable Car Clothiers, No.150 Post, S.F., Ca 94108

Item	Qty.	Colour / Fabric	Size
Shorts			

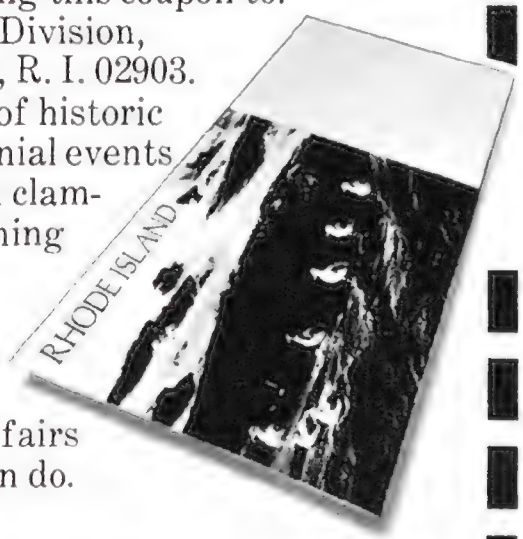
M.O. or Check ☐ Cable Car Chg. ☐ Sorry, no COD's
☐ Please send catalogue (415) 397-4740

Name.....
Address.....
.....Zip.....
Add $1.85 Ship. & Hdlg. • 6½% Sales Tax in Ca. 500501

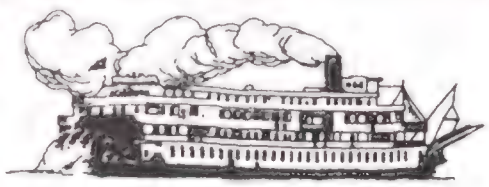
IF YOU HAVEN'T SEEN RHODE ISLAND, YOU HAVEN'T SEEN NEW ENGLAND.

You can see the best New England has to offer. Right here in Rhode Island. Get a free Rhode Island Vacation Kit tailored to your special interests by mailing this coupon to: Rhode Island Tourist Promotion Division, One Weybosset Hill, Providence, R. I. 02903.

I'm interested in: ☐ Tours of historic mansions and sites ☐ Bicentennial events ☐ Camping ☐ R. I. Seafood and clambakes ☐ Boating ☐ Sports fishing ☐ Golf courses ☐ Museums ☐ Art shows, concerts, theater ☐ Scenic bus and boat tours ☐ House and garden tours ☐ Windjammer cruises ☐ Craft fairs ☐ Antiques ☐ What the kids can do.



Name _____
Address _____
City _____ State _____ Zip _____
SM



Fantastic Voyage.

That's one way to describe a cruise on the Delta Queen—the steam-powered "time machine" that follows the ghostly wake of the early river packets back into history.

On the Delta Queen you'll return to an older America that once thrived on the riverboat trade. And you'll enjoy riverboat life that is much the same as it was then. Endless changes of scenery, traditional "steamboat" entertainments and succulent old South cookery will make your trip a memorable experience.

Choose from cruises originating in New Orleans, St. Louis, Cincinnati, Pittsburgh, and St. Paul. For a brochure and cruise schedule see your travel agent or write the Delta Queen, Dept. SM05, 322 E. Fourth Street, Cincinnati, Ohio 45202.

DELTA QUEEN
VOYAGES to AMERICA

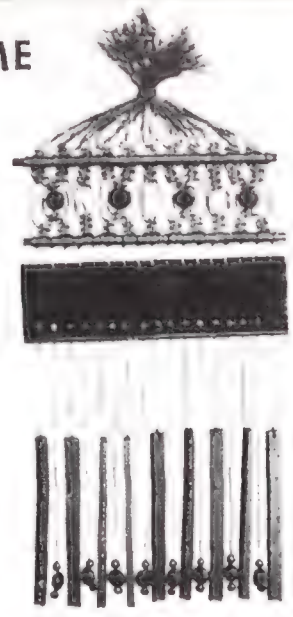
WIND CHIME

Assemble this chime, hand-crafted of linen, wood and stoneware to add a new dimension to your patio with clear gentle sounds of spring

Send $12. plus $1. shipping

ILL. RESIDENTS ADD 5% TAX

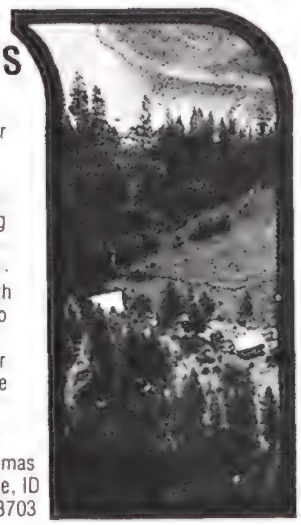
Cabbages and Kings
568 W. Arlington Place
Chicago, Ill. 60614



© Copyright 1975 by Eileen Knoufl

YOUR EXCLUSIVE RANCH IN IDAHO'S PRIMITIVE AREA

Nestled on the big bend of the River of No Return, Allison Ranch is yours alone. Off in the Salmon River Breaks Primitive Area where there's lots to do, or lots of nothing to do. Ride, hike, fish, swim, ride the river, or sun on a sandy beach. Comfortable accommodations with absolute privacy for parties of up to eight. Everything furnished — including the solitude. Go in by air or jet boat. For reservations by the week, May through September



ALLISON RANCH
Harold & Phyllis Thomas
5727 Hill Road, Boise, ID
208/344-0951 83703

THE GUARANTEED BINOCULARS*

SWIFT®

***An offer you can't refuse!**

We know you want quality. So we make our line of Mark I Binoculars by hand. They're compact, lightweight and are high in resolving power. But here's the best part; Swift's lifetime guarantee: We'll repair or replace defective parts or workmanship for the life of the instrument at no charge at all, except postage. If you don't know where to look for Swift Binoculars, write:

Swift Instruments, Inc., 952 Dorchester Ave., Boston, Mass. 02125 or P.O. Box 562 San Jose, Calif. 95106.

Additional reading

Trinidad's birds (p. 34)

A Guide to the Birds of Trinidad and Tobago by Richard ffrench, Livingston Publishing Co., 1973

The Wildlife Sanctuaries of Trinidad and Tobago by the Wildlife Conservation Committee, Ministry of Agriculture, Land and Fisheries, Trinidad, 1972

St. Francis Xavier (p. 42)

The Life and Letters of St. Francis Xavier, 2 volumes, by Henry James Coleridge, S.J., Burns Oates and Washbourne Ltd., 1935

Saint Francis Xavier by James Brodrick, S.J., Burns Oates (London), 1952

St. Francis Xavier Apostle of the East by Margaret Yeo, The MacMillan Co., 1932

John Rogers (p. 50)

John Rogers, The People's Sculptor by David H. Wallace, Wesleyan University Press, 1967

John Rogers' Groups of Statuary by Paul and Meta Bleier, 783 Oakleigh Road, Valley Stream, New York, 1971

Rogers Groups: Thought and Wrought by John Rogers, by Mr. and Mrs. Chetwood Smith, Charles E. Goodspeed & Co., 1934

Toilets (p. 60)

Clean and Decent by Lawrence Wright, Viking Press, 1960

Stop the Five Gallon Flush! by the Minimum Cost Housing Group, School of Architecture, McGill University (Montreal), 1973

The Bathroom by Alexander Kira, Bantam Books, 1967

"Human Wastes Can Be Recycled" by Robert Rodale, *Organic Gardening and Farming*, February 1972

"A Simple Process for Composting Small Quantities of Community Waste" by Rikard Lindstrom, *Compost Science*, Spring 1965

"The Clivus Toilet—Sanitation Without Pollution" by Lawrence D. Hills, *Compost Science*, May-June 1972

"Flush Toilets: They Overload the Sewers, Steal Our Tax Dollars, So Let's Get Rid of Them" by Neil Seldman, the *Washington Star-News*, December 22, 1974

Teddy Tucker (p. 68)

History Under the Sea by Mendel Peterson, Smithsonian Institution Press, 1969

The Treasure Diver's Guide by John S. Potter jr., Doubleday and Co., Inc., 1972

Puppets (p. 74)

Dictionary of Puppetry by A.R. Philpott, MacDonald and Co. (London), 1969

Dolls and Puppets by Max Von Boehn, Cooper Square Publishers, Inc., 1966

Bunraku by Tsuruo Ando, Walker-Weatherhill, 1970

The Puppet Theatre in America, A History: 1524 to Now by Paul McPharlin, Harper & Row, 1949

Alvin Weinberg (p. 82)

"Energy from Breeder Reactors" by Floyd L. Culler jr. and William O. Harms, *Physics Today*, Volume 25, May 1972

"The Moral Imperatives of Nuclear Energy" by Alvin Weinberg, *Nuclear News*, Volume 14, December 1971

"Current Economic Status of the U.S. LMFBR Program" by Thomas B. Cochran, Natural Resources Defense Council (Washington D.C.), October 16, 1974

Reflections on Big Science by Alvin M. Weinberg, The Massachusetts Institute of Technology Press, 1967

Newsreels (p. 90)

The American Newsreel, 1911-1967 by Raymond Fielding, University of Oklahoma Press, 1972

INDIAN PHOTOGRAPHS FROM THE SMITHSONIAN

OFFERED FOR THE FIRST TIME IN 11" x 14" SETS FOR FRAMING

From historic negatives of the Smithsonian's National Anthropological Archives, 4 sets of 5 prints. Only $15 per set. Order all 4 sets for only $55. Each photo is sepia toned and complete with caption. Write for FREE description.

- Set 1—Selected Portraits
- Set 2—Lifestyles, Northwestern Indians
- Set 3—Lifestyles, Southwestern Indians
- Set 4—Lifestyles, Plains Indians

Please send ___ each of set(s) number _____ of 11" x 14" American Indian Photographs @ $15 per set; or all 4 sets for $55. Total enclosed $_____

NAME

ADDRESS

CITY STATE ZIP

75—5

MAIL ORDERS TO: Photographic Services, Smithsonian Institution, Washington, D.C. 20560

L.L.Bean, Inc.

Boat and Tote Bag

Sturdily constructed from extra heavy white duck. Large capacity for carrying provisions, bulky items and clothing. An excellent shopping bag. Two colors: White with Red trim. White with Blue trim. Two sizes: Small, 6" x 13½" x 12" high. Price, $7.00 postpaid. Large, 8" x 17" x 16" high. Price, $8.35 postpaid.

☐ Send Free Catalog

Ship _____ Boat and Tote Bags @ $7.00 postpaid

Ship _____ Boat and Tote Bags @ $8.35 postpaid

Name_____

Address_____

City_____

State_____ Zip_____

Outdoor Sporting Specialties

L. L. Bean, Inc.

507 Main St., Freeport, Maine 04032

Booked For Celebration

Just in time for America's bicentennial — revised and updated editions of these lively and widely acclaimed volumes on the nation's fundamental charters.

THE STORY OF THE DECLARATION OF INDEPENDENCE

Text by Dumas Malone. Pictures by Hirst Milhollen and Milton Kaplan. With nearly 300 illustrations, deluxe, oversize format, $15.00

A BIOGRAPHY OF THE CONSTITUTION OF THE UNITED STATES

Its Origin, Formation, Adoption, Interpretation
Second Edition
Broadus and Louise Pearson Mitchell
$12.95

OXFORD UNIVERSITY PRESS
200 Madison Ave.
New York, N.Y. 10016

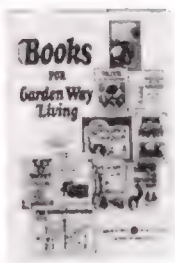
A New Dimension In Leisure

awaits you in a wonderfully unspoiled mountain and country setting. The Spalding Inn Club (on a delightful estate in the **White Mountains**) has superb facilities and offers an interesting social and sports program: summer theatre, golf, par-3 golf, tennis, lawn bowling, heated pool, trout fishing. 70 modern guest rooms and deluxe cottage suites with fireplaces. Cocktail lounge. Food, service and wine cellar of unusual excellence. Room with 3 meals (choice of distinguished menu) from $28 to $39 daily, per person, double occupancy. Open June thru Oct.

For brochure, reservations, call 603-837-2572 *or write E. W. Spalding.*

Spalding Inn Club

Whitefield, N.H. 03598



GARDEN WAY'S ALL NEW

1975 BOOK CATALOG

Best Books on Gardening, Building and Making Do!

Books on the arts of simpler living, home food gardening and house repair will become increasingly valuable for **enjoying** the years ahead. Garden Way Publishing specializes in providing the **very best** of these books, those which will translate your growing interest in **lower cost, more self-sufficient living into a money-saving reality!**

Vegetable, Fruit and Herb Gardening; Alternate Energy (solar, wind, water, methane, wood); Canning, Freezing, Drying; Homemade Bread, Cheese, Wine; Hand-crafted Furniture, Quilts; Raising Poultry, Goats, Livestock; Building Pole Homes; Stone Walls; Homesteading.

Books are for beginners and advanced and priced from 50¢ to $15. Do send NOW for your 64-page Book Catalog. Please enclose **25¢** for postage and handling.

GARDEN WAY PUBLISHING CO., DEPT. 50475, CHARLOTTE, VERMONT 05445

Clear days and sparkling nights, in a high mountain valley near Rocky Mountain National Park. Enjoy exciting western fun: horses, hiking, mountain climbing, breakfast, & steak rides, cookouts, and heated pool. Golf course nearby. Children's counselor on duty.

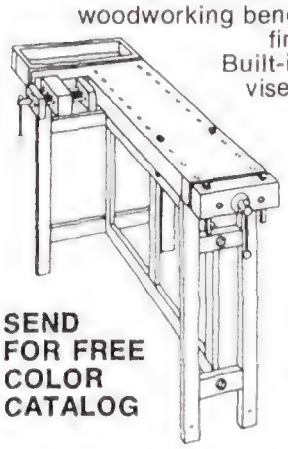
Write for brochure

swiss village guest ranch

Longs Peak Route 'E' Estes Park, Colorado 80517

woodworking benches woodcrafting tools

Danish crafted SOLID Danish Beech woodworking benches ruggedly made and finished like fine furniture. Built-in vertical and horizontal vises and adjustable surface dogs hold any shape workpiece. Available in 49", 60" and 80" models. One even folds for easy storage.



HAND FORGED turning gouges, chisels and sculptor's gouges, carving tools, handsaws and uniquely styled woodscrew drivers from Europe's finest toolmakers. The best the world can offer.

SEND FOR FREE COLOR CATALOG

Name _____

Address _____

City _____ State _____ Zip _____

LEICHTUNG & GALMITZ, INC.
5187S Mayfield Rd. Cleveland, Ohio 44124

Smithsonian highlights

Benefit Auction for Cooper-Hewitt Museum of Design in New York

The second annual auction of objects donated expressly to benefit the activities of the Smithsonian's Cooper-Hewitt Museum of Design in New York is being held in the garden of the Carnegie mansion, 9 East 90th Street, beginning May 16. The auction program includes a public preview and "silent" bidding on a selected group of objects, May 16, 17 and 18. The final event, the public auction of about one hundred special items, takes place on the evening of May 20. John L. Marion, President of Sotheby Parke Bernet is the auctioneer. A $4 catalog can be purchased as an admission ticket. For information, call (212) 860-2011.

Mt. Hopkins Observatory in Arizona Open to Visitors

The Smithsonian Astrophysical Observatory's Mt. Hopkins facility at Amado, Arizona, 38 miles south of Tucson, is open to visitors between 10 A.M. and 3 P.M., May 3 and 4. Tours of the astronomical instruments and research facilities will be conducted at the 7,600-foot level of the mountaintop observatory. Mt. Hopkins will soon be the site of a new multiple-mirror telescope, a joint project of the Smithsonian Institution and the University of Arizona. Another "open house" will be held in the fall. For additional information, call (602) 792-6358.

SMITHSONIAN INDEXES

Yearly indexes are available, at $1 each (April 1970-March 1974). The new index, March 1974 through April 1975, will be available in early summer.

Divisions of Performing Arts and Musical Instruments

The American premiere of "Barong Display" is presented by the Otrabanda Company, an experimental theater created by Flemish director and playwright Tone Brulin—May 2, 8 P.M., Baird Auditorium, Museum of Natural History.

This season's final Jazz Connoisseur program hosts innovative pianist and composer Andrew Hill—May 4, 5:30 P.M., Hall of Musical Instruments, Museum of History and Technology.

Women in Country Music presents Mother Maybelle Carter in concert—May 18, 8 P.M., Baird Auditorium.

Phyllis Bryn-Julson is the featured artist in the Theater Chamber Players concert which includes works by Schoenberg, Dallapiccola, Schubert and Maurice ben Hamou—May 19, 8:30 P.M., Baird Auditorium, Museum of Natural History.

For additional program and ticket information, call (202) 381-5395.

Festival of American Folklife

The ninth annual Festival of American Folklife will be held on the 50-acre national Mall June 25-29 and July 2-6. The festival, which has become a major summertime event in Washington, features exhibits, demonstrations, concerts, dances, crafts, native foods and experiences for all ages. Six major areas—Old Ways in the New World, Native Americans, Working Americans, Regional Americans, Family Folklore and Children's Area—present a vast picture of traditional American folk culture. Additional details will appear in next month's SMITHSONIAN. For information, call (202) 381-6525.

Renwick Gallery

"A Modern Consciousness: D.J. De Pree and Florence Knoll" honors two individuals who helped shape the course of modern furniture design and its international acceptance. The exhibition reviews, in chronological groupings, some of the major pieces of furniture by American designers associated with two major furniture companies, Herman Miller Incorporated and Knoll International. De Pree and Knoll were the companies' visionaries and were highly responsible for their success—through November.

British Columbia, Canada.

These pictures are just a sample of what is waiting for you in British Columbia. 1. One of many intriguing shops that can be found throughout the Province. 2. Long Beach on Vancouver Island, 11 miles of unbroken beach on the Pacific Ocean. 3. The Williams Lake Stampede. Dozens of rodeos take place all summer long in British Columbia's cattle country. 4. An outdoor restaurant in Gastown, the original settlement of British Columbia's largest city, Vancouver. For more pictures and lots more information write: British Columbia Department of Travel Industry, 1019 Wharf Street, Victoria, British Columbia V8W 2Z2. Or see your local travel agent.

For the time of your life.

THIS YEAR COME SEE

A FOREIGN LAND ...

THE REAL AMERICAN WEST

America? Foreign? You bet it is! After all, what could be more foreign than 2,000,000 wilderness acres where snow-clad peaks soar into skies that have never known pollution's taint? Or solitary lakes and rivers so pure that you can lie on your belly and drink your fill. Or cathedral groves of giant cedar that were ancient before Columbus. This is the awesome Selway-Bitterroot Wilderness where we — your licensed and bonded outfitters — will guide you into the private domain of deer, bear, elk, cougar, wheeling eagles and fighting trout. Roadless. Spectacular. Wild. And Free . . . Meanwhile, back at the ranch, superb log cabins and authentic teepees house our guests in the Old West setting of a working ranch. Enjoy riding, hiking, boating, fishing, swimming, chuck wagon feeds, moonlight cruises, weekly rodeos and just easy relaxin' by the shining lakes of Idaho's unspoiled panhandle. Good fun! Great food! Grand friendships!

TIMBER RIDGE RANCH G

P.O. Box 83, Harrison, Idaho 83833

Please tell me more about "foreign" America. Send me complete information on wilderness and ranch vacations today!

Name _____

Address _____

City _____ State _____

Zip _____ Phone _____

THE SMITHSONIAN'S POSTAL RARITIES ON COLOR SLIDES

From the Smithsonian's National Postage Stamp Collection, this unique set of 35mm color slides depicts 50 U.S. and foreign rarities, complete with guide. Only $20 per set. Also available, slides of 10 U.S. Space Series stamps at $6 per set. Order both sets for only $24.

Please send __ set(s) of Postal Rarity slides @$20; __ set(s) of Space Stamp slides @$6; or __ complete set(s) @$24. Total enclosed $_____.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PR75—5

MAIL ORDERS TO: Photographic Services, Smithsonian Institution, Washington, D.C. 20560

National Collection of Fine Arts

"Pennsylvania Academy Moderns, 1910-1940" is a collection of 43 paintings by artists who were students at the Academy. All of the painters spent time in Europe absorbing knowledge of new art movements and each felt a need to find an expressive median between the new and the traditional. The group of paintings reflects the kind of impact that cubism, abstractionism, fauvism and futurism had on artists trained at one of the oldest art schools in this country. Represented in the show are Hugh Breckenridge, Arthur Carles, Charles Demuth, Henry McCarter, Carl Newman, H. Lyman Sayen, Morton Livingston Schamberg and Charles Sheeler—opens May 9.

"Kaleidoscope: A Day for Children" takes place in NCFA's courtyard and museum exhibition areas. This year's children's day theme is "Line, Color and Shape." Children can make banners and wire sculptures, use video equipment, learn monoprinting techniques or join Margaret Ramsay and her group, "Fusion," in improvisational dance. The activities are planned for children aged 4-12 —Saturday, May 10, 10 A.M. to 4 P.M. Admission free.

The "24th National Exhibition of Prints" presents works chosen from juried competition co-sponsored by NCFA and the Library of Congress. Fifty-five prints chosen from 895 entries comprise the biennial show—opens May 23.

National Portrait Gallery

The Gallery's second major Bicentennial exhibition, "The Dye Is Now Cast: The Road to American Independence, 1774-1776," is a chronicle of the two crucial years leading to the signing of the Declaration of Independence. The story of the years is interpreted through paintings, sculpture, documents, maps, prints and associative items installed in furnished settings that evoke the period—through November 16.

Parking on the Mall

Metro construction has made all parking on the Mall extremely difficult. For up-to-date information on alternate parking areas and public transportation, write the Associates Reception Center, Smithsonian Institution, Washington, D.C. 20560, or call (202) 381-6264.

MEXICANA by Revelations®

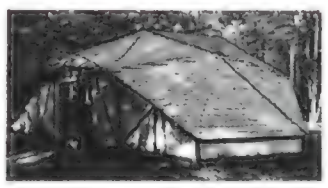
Desco's Red Carpet® construction features foam-padded lining; cloud-soft cushioned insoles; arch supports; foot-molded comfort lasts. Plus Genuine Leather uppers, handwoven w/contrasting color Leather thongs. Padded tricot-lined vamp; adjustable strap. Flexible Leather covered 2" wedge. **Natural** w/ **Brown** or **White** w/ **Multi.** Full & ½ sizes **6-10 N, 5-10 M & W.**

$24 plus $1 postage

Satisf. Guar. *$10 dep. on COD*

OLD PUEBLO TRADERS-N5M

600 South Country Club Tucson, Az. 85716



Build an OMEGADOME™ . . . primarily of wood. Available as do-it-yourself plans, strut kits, bolt-together panels. For complete data and scale model send $5.00 (refunded on purchase) to:

AMERICAN GEODESIC, INC.

Box 164s, Hampden Highlands, Maine 04445

Note: Patent Applied For

THE UNBELIEVABLE INN

Unbelievable beauty surrounds you. Spectacular mountaintop views, 25 lovely rooms, beamed ceilings, fireplaces, library, great food and intimate lounge! Golf course, pool; lakes nearby, guided tours to White Mtns. and much more. *Call Toll Free* **1-800-447-4470** *or write J. D. Walker, Innkeeper.* **The INN at Steele Hill**

Laconia, N.H. 03246

Your Own Family

COAT OF ARMS

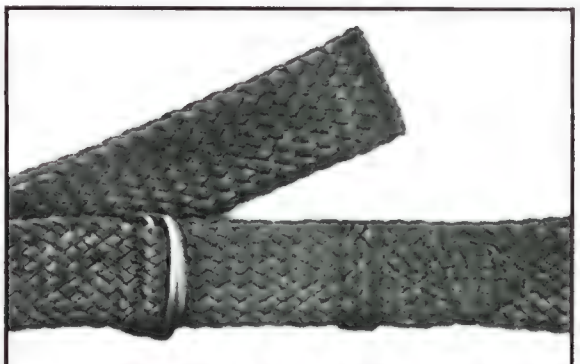
Individually carved in solid mahogany

Send for our colorful brochure

Baldwin Studios

11 Woodland Drive, Dept. A

Springfield, Vermont 05156



BRAIDED CALFSKIN BELTS

These pliant comfortable belts are hand braided from sixteen strands of specially tanned calfskin. The width is one and one-half inches, the color natural tan. The distinctive dees in the closure are sand cast brass.

No. 817C **1½ inch** **$12.50 ppd**

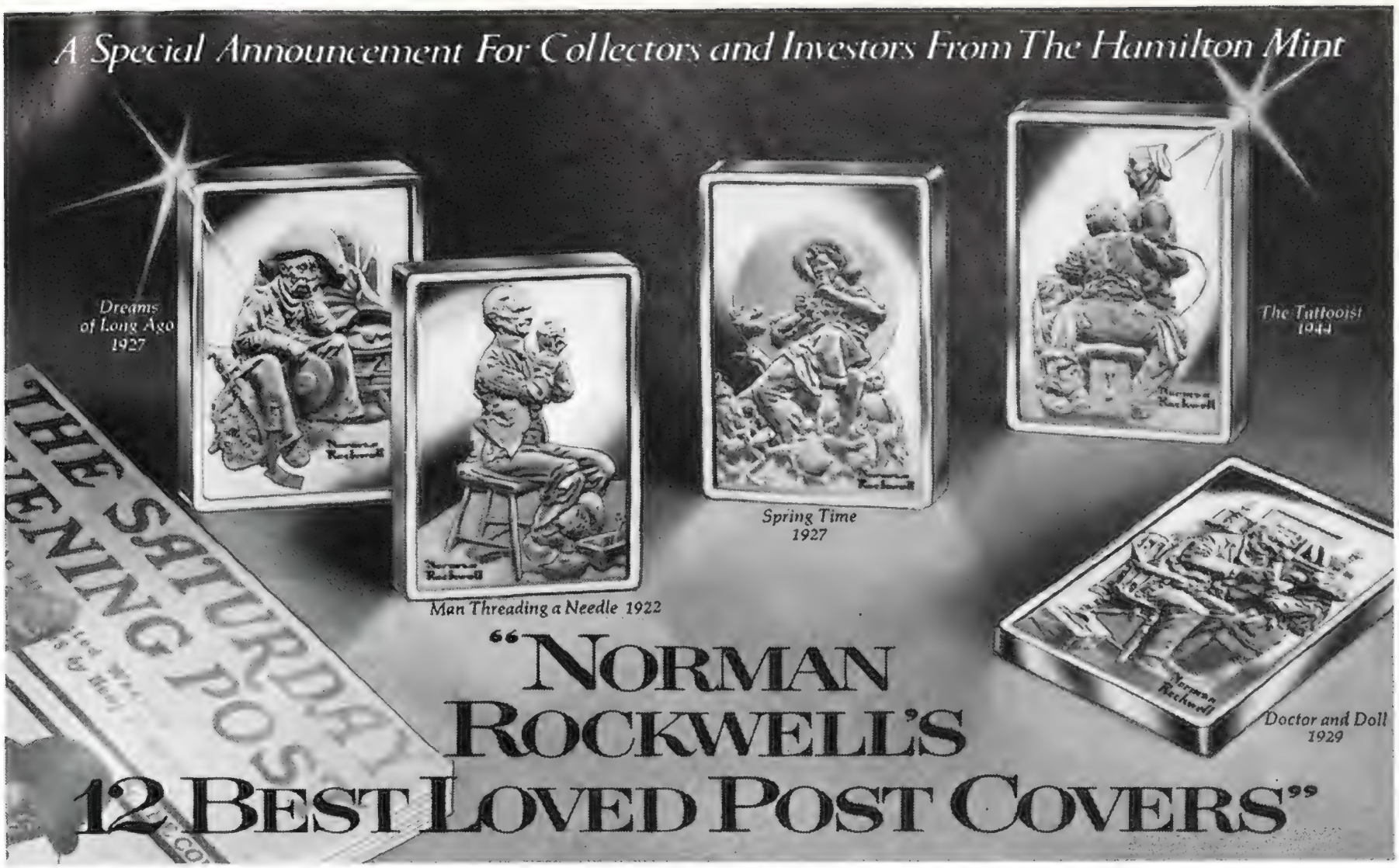
Please state waist size

Satisfaction Guaranteed. **Order Now.**

Send for our unique catalog

AUSTRAL ENTERPRISES

P.O. BOX 70190 SEATTLE, WA 98107


A Special Announcement For Collectors and Investors From The Hamilton Mint
Dreams of Long Ago 1927
Man Threading a Needle 1922
Spring Time 1927
The Tattooist 1944
Doctor and Doll 1929
THE SATURDAY
ENING POS
"NORMAN ROCKWELL'S 12 BEST LOVED POST COVERS"

A NEW LIMITED EDITION OF PROOF FINISH SOLID SILVER INGOTS ONLY 10,000 SETS—WHEN THESE ARE GONE, THERE'LL BE NO MORE!

A Strictly Limited First Edition Set of 12 Ingots in .999 Fine Silver only $13.75 per Ingot.

For over 40 years, Norman Rockwell chronicled America and Americans in a series of memorable covers for The Saturday Evening Post. Since 1916, Rockwell's cover art has lovingly and authentically depicted a colorful pageant of life in America from an age of innocence until the present.

As a permanent tribute to this unique individual and to America, The Hamilton Mint, by exclusive permission from *The Saturday Evening Post* is extremely proud to present a significant new medallic series—The Norman Rockwell Best Loved *"Post"* Cover Collection.

EXQUISITELY CRAFTED WORKS OF FINE ART

With this announcement, you now have the opportunity to obtain this superb collection of 12 solid silver ingots, each one illustrating one of Rockwell's best-loved *"Post"* covers. Each will be a striking example of the minter's art and faithfully capture the flavor of the Rockwell original. Each gleaming ingot will contain one ounce (480 grains) of .999 fine silver, the finest and purest available.

The ingots will be issued on a convenient one-a-month basis over a 12 month period. At that time, subscribers will have amassed a total of 5,760 grains of silver, more than the average person accumulates in a lifetime.

A STRICTLY LIMITED FIRST EDITION

This *"Post"* Cover Collection will be a first edition and quite rare. Only one proof set will be issued to each subscriber, and to further enhance the exclusivity of the offering, this edition is limited to just 10,000 sets. After those subscriptions have been filled, the minting dies will be destroyed to safeguard the integrity of the edition.

Deluxe Edition: 24 Kt Gold on Pure Silver
You may, at your option, order these ingots in exquisite 24 Kt Gold layered on .999 fine silver. The 5,000 sets thus offered will also be individually hallmarked and serially numbered. Each ingot will cost $18.75.

YOUR PERSONAL SERIAL NUMBER

Each ingot will bear your own personal serial number. Serial numbers will be assigned in the order applications are received, the lower and potentially most desirable numbers going to the earliest subscribers. Each ingot will also bear The Hamilton Mint Hallmark.

You will also be issued a Certificate of Authenticity, attesting to the limited edition status and precious metal content of your ingots.

INVESTMENT POTENTIAL

This collection is certain to be treasured by knowledgeable collectors for its rarity, great beauty and inherent value.

The opportunity to acquire this series in precious metal also comes at a time when prominent advisors are predicting a continued rise in the price of precious metals in the years ahead.

SIGNIFICANT ORIGINAL PRICE GUARANTEE

Under the terms of this offer, The Hamilton Mint is officially committed to deliver to you at the original issue price of $13.75 each, the complete set of 12 ingots over a 12 month period, regardless of how high the price of silver and gold climbs. The Hamilton Mint does reserve the right to limit the edition below the published maximum limits, but once your application is validated and accepted, your subscription is guaranteed.

Please remember that there is a strict limit of 10,000 proof sets, so prompt action is essential if you wish to be included.

SPECIAL DISPLAY CASE FREE

All subscribers will receive, at no cost, a deluxe, felt-lined woodgrain case to preserve and display ingots.

© THE HAMILTON MINT 1975

SMM 575

Official Subscription Form

"NORMAN ROCKWELL'S
12 BEST LOVED POST COVERS"

**The Hamilton Mint, 40 E. University Drive
Arlington Heights, Ill. 60004**

Please accept my application for a complete Limited First Edition proof set of "Norman Rockwell's 12 Best Loved Post Covers." I understand that I will receive my first ingot soon after my order is approved and thereafter receive an invoice once a month for the prepayment of the next ingot in the series. I further understand that I will receive a deluxe display case, at no charge, to house my entire collection. Enclosed is my check or money order for $_____ or charge my order as indicated below.

AN OPPORTUNITY TO BUY SILVER SERIES AND SAVE

☐ Send me my first ingot in .999 fine silver for only $13.75 (plus 75¢ for post. & insur.)

☐ Send me my first ingot in 24 Kt Gold layered on .999 fine silver for only $18.75 (plus 75¢ for post. and insur.)

Charge order to my:

☐ Master Charge* ☐ BankAmericard

Acct. No._____ Exp. Date_____

*If using Master Charge, also indicate four numbers above your name here_____

Name _____
(please print)

Address _____

City _____

State _____ *Zip*_____

Signature _____
(must be signed to be valid)

I WANT JUST SINGLE INGOT: I understand that I can order just the first ingot in the series, Rockwell's First *"Post"* Cover (1916), but then I do not get the savings, the ingot will not be serially numbered, and no future ingots will be reserved for me.

☐ Single ingot @ $14.95 in .999 fine silver.

☐ Single ingot @ $19.95 in 24 Kt Gold on .999 fine silver

(Please add 75¢ for post. & insur. per ingot.)

LIMIT: ONE PROOF SET PER SUBSCRIBER

Application subject to acceptance by The Hamilton Mint
(Illinois & Louisiana add applicable sales tax.)

THE HAMILTON MINT, LOCATED IN ARLINGTON HEIGHTS, ILLINOIS, IS THE WORLD'S 2ND LARGEST PRIVATE MINT.

SMITHSONIAN ASSOCIATES

ANNOUNCING

The Official Custom Designed Tie for Smithsonian Associates

Regimental gold, red and white stripes set in a blue field. The colors are the Smithsonian Institution's own taken from the heraldry of the family of the founder, James Smithson.

The polyester ties were specially tailored for Smithsonian Associates by C. H. Munday, Ltd., a foremost London designer of men's accessories.

The Smithsonian Associate Tie
Reception Center, Great Hall
Smithsonian Institution
Washington, D.C. 20560

Please send me the Smithsonian Associate Tie at the price of $9.00 plus $1.00 for shipping and handling.

I enclose ☐ check ☐ money order made payable to The Smithsonian Institution.

Member's Name

Street

City State Zip

SWIM SNEAKS

ALL RUBBER BATHING & SHOWER SHOES

Outdoors and indoors, you'll want **high quality Italian imported** rubber bathing shoes...with thick treaded bottoms and built-in inner soles. Sure-footed **protection** on shoreline rocks, pool or boat decks, and shower floors. Eliminate sore feet on sharp rocks, shells, or hot sand. Styled for **comfort** and **good looks.** Flexible, lightweight, easy on and off. Great in and out of water. Available in white, yellow, blue and red. Complete range of men's, women's and children's sizes. Specify shoe size and width. $6.98 per pair. Add 50¢ per pair for postage & handling. Add add'l 25¢ for rush service. Tel. (201) 967-0373.

Dorsay Dept. RB2

240 Kinderkamack Rd.,
Oradell, N.J. 07649

2" x 2" x ¾"

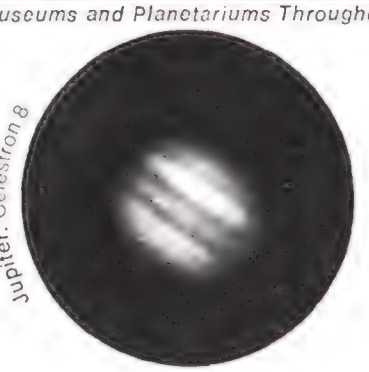
YOUR LOGO ON
POLISHED MARBLE PAPERWEIGHTS

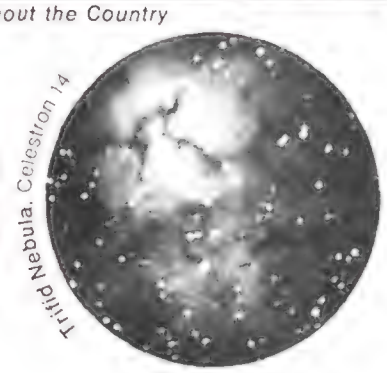
100 Minimum $225. total cost. Your logo etched in up to 5 matched colors. Spread good will at minimum cost. Free sample paperweight and literature. Letterhead requests only.

PAPERWEIGHTS, INC. Dept. SM
100 Broadway, Garden City Park, New York 11040 (516) 741-2800

Celestron® Multipurpose Telescopes

On Display at Museums and Planetariums Throughout the Country





The Choice. Three reasons why experienced telescope enthusiasts and leading colleges, universities and science centers the world over repeatedly select Celestron telescopes:

The Celestron 5. A tabletop observatory for exploring the Moon, planets, scores of open star clusters and gossamer nebulae at up to 300X. For casual observing or telephotography, rest the instrument on any flat surface, swing up the tube and focus. Close in on the whiskers of a squirrel at the near focus of 20 ft. or the face of a friend at half a mile. The 3½-lb. tube demounts for hand-held shots at 25X. (Size swung down: 7" x 8" x 16", Wt.: 12 lbs., Base price, including electric clock drive and setting circles, $720)

The Celestron 8. Eight full inches of aperture make this portable observatory in a suitcase the amateur's favorite for studying the surface features of Mars, the subdivided rings of Saturn, the ever-changing belt structure of Jupiter, the intricate filamentary detail of deep-sky nebulae, the central regions of globular clusters at up to 500X. Also the ultimate terrestrial telescope or telephoto! (Size swung down: 9" x 12" x 22", Wt.: 23 lbs., $845)

FREE COLOR CATALOG

The Celestron 14. The appeal of this prestigious, fully electric dome instrument is enhanced by a unique design that also makes it the world's largest one-man-portable. Demount and load it into your compact car in five minutes! Within range of the Celestron 14, at up to 850X, are the delicate contrast levels of the diffuse and planetary nebulae, the spirals of remote galaxies and the quasars. (Size swung down: 18" x 22" x 44", Wt.: 108 lbs., $3,750)

Celestron Pacific 2835 Columbia • Box 3578-SM • Torrance, CA 90503
World's Leading Manufacturer of Compact-Portable Telescopes

Traveling Exhibition Service

There are up to 70 different Smithsonian-sponsored exhibitions on display each month throughout the United States and Canada. For a complete listing and information on how to bring an exhibit to your area, write Traveling Exhibition Service, Smithsonian Institution, Washington, D.C. 20560.

- Marysville, California — "Our Only World" (Yuba College, May 10-June 8).
- Stamford, Connecticut — "Delacroix and the French Romantic Print" (The Stamford Museum and Nature Center, May 10-June 8).
- Galena, Illinois — "Suiting Everyone" (Old Market House Street Memorial, May 3-June 1).
- Acton, Massachusetts—"The Inaugural Story from George Washington to Gerald Ford" (TNT, Inc., May 3-September 7).
- Dearborn, Michigan—"Manuscripts of the American Revolution" (Dearborn Historical Museum, May 3-June 1).
- St. Louis, Missouri—"American Coverlets" (Missouri Historical Society, May 17-June 15).
- Cincinnati, Ohio—"Our Only World" (Cincinnati Enquirer, May 10-June 8).
- El Paso, Texas—"Folk Baroque in Mexico" (El Paso Museum of Art, May 3-June 1).
- Lynchburg, Virginia—"Black Presence in the Era of the American Revolution" (Central Virginia Community College, May 3-June 1).

Smithsonian Commons

Located in the original Castle building, the Commons offers a buffet luncheon entrée for a fixed price of $3.25, with a reduced rate for children. The Commons and the Reception Center provide a place for Associates and their families to obtain information and lunch while visiting the national museums on the Mall. Luncheon hours are 11:15 A.M. to 2:15 P.M., seven days a week. An Associates' card is required. Seating may be limited during the spring tourist season.

Spring Museum Hours

The Smithsonian museum buildings are open daily from 10 A.M. to 9 P.M. with the exceptions of the National Zoological Park (9 A.M. to 6 P.M.) and the Hirshhorn Museum and Sculpture Garden (10 A.M. to 5:30 P.M.). For general information, call the Associates' Reception Center, (202) 381-6264.

Checkbook with a brain

Never make another checkbook error with America's first computerized banking center in a case.

The new Corvus CheckMaster is a checkbook holder with a built-in computer—a time-saving device that will keep you in perfect balance for every check you write, every day of the year.

YOUR BANK WILL LOVE YOU

If you're like most Americans, your checkbook is a disaster area. And your electronic calculator isn't helping much.

Now, there's a great new space-age product called the Corvus CheckMaster designed specifically to keep you in perfect balance, for every check you write, every day of the year. And it's actually easier to use than a calculator.

HERE'S HOW IT WORKS

Open your checkbook holder and turn on the built-in computer. Press the "Balance" key, and your bank balance is recalled on the display. The CheckMaster memory is so powerful that it never forgets your balance—even months after you last recall it.

Enter the amount of your check, and press the "Check" key. The check amount is automatically deducted from your balance, and your new balance is displayed—and all with just one key stroke.

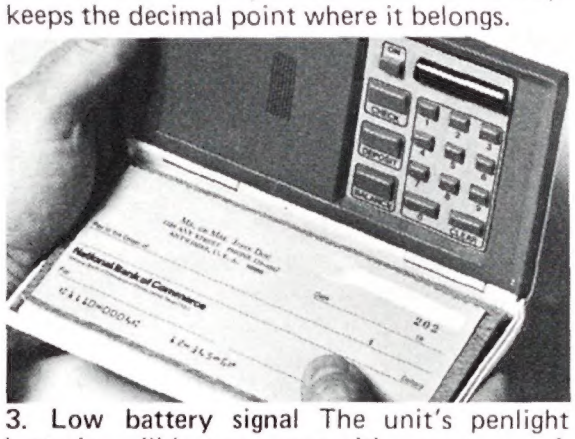
Or enter the amount of a deposit, and press the "Deposit" key. Your deposit is automatically added to your balance, and again, your new balance is displayed.

MANY EXTRA FEATURES

The Corvus CheckMaster does so much, so easily, and it's great fun to use. Here are seven reasons why:

1. Easily corrects mistakes If you enter the wrong digits, press the "Clear" key. Only your mistake will be cleared—never the balance.

2. Worry-free decimal Just enter the digits. The unit's dollar-position decimal always keeps the decimal point where it belongs.



3. Low battery signal The unit's penlight batteries will last one year with average use. A low battery signal on the display will indicate when it's time to replace them.

4. Overdraft alert CheckMaster will signal an overdrawn account plus show the overdraft amount and help you avoid the embarrassment of having a check accidentally bounce.

To find out your exact balance, even months after you've last recalled it, simply open your case and press the balance key. CheckMaster's memory never forgets. Designed for both men and women, CheckMaster holds any standard-sized personal checks, check register, credit cards and important papers.

5. Safety switch If you forget to turn off your computer, don't worry. Whenever you close your case, your unit shuts off automatically.

6. Private viewing angle Don't worry about anyone seeing your balance. The red display can only be viewed by the user and registers up to $9,999.99 or any six digits.

7. Perfect size The CheckMaster's handsome tan and cream-colored case measures 7/8" x 3 5/8" x 6 3/4" and weighs only 8 ounces.

RUGGED AND SHOCKPROOF

Drop it, sit on it, drop it again—CheckMaster's shock-proof case will withstand plenty of abuse. The integrated circuit is hermetically sealed for a lifetime of trouble-free service. A spot of gold is even used in the circuit's final sealing process to insure CheckMaster's very high level of reliability.

CONTROL YOUR PURCHASES

Take CheckMaster with you to the supermarket. Set a dollar limit on what you intend to buy. Then enter each item you purchase as if you were writing a check. When your balance reaches your limit, stop buying and head for the check-out counter. It's a great way to control your budget and prevent overcharging by the check-out clerk.

THE PERFECT GIFT

CheckMaster makes the ideal gift for your wife, husband, friend or anybody who has a personal checking account. Even a person who already owns a calculator will appreciate CheckMaster's value and convenience.

$39.95 NATIONAL INTRODUCTORY PRICE

The CheckMaster is perfect insurance against bounced checks, overdrafts, arithmetic errors and bank errors. Its powerful memory, simple operation, and many extra features make it another example of how space-age technology has made fun out of one of the most time-consuming household tasks.

MORE THAN GUARANTEED

The Corvus CheckMaster will make such an improvement in helping you balance your checkbook that we make the following unusual money-back guarantee: use the CheckMaster until your next bank statement arrives or for one full month. If the CheckMaster does not balance your checkbook perfectly and actually pay for itself in either convenience or actual savings, return it for a prompt and courteous refund. You can't lose.

A NATIONAL INTRODUCTORY PRICE

The American-made CheckMaster is manufactured by Corvus, a wholly—owned subsidiary of Mostek Corporation and a leading consumer electronics manufacturer. Mostek was the first company to manufacture the integrated circuit—the heart of today's pocket calculator. JS&A is the world's largest single source of electronic calculators, digital watches and other space-age products. We have purchased the entire initial CheckMaster production to sell exclusively through the mail for only $39.95 during its national introduction.

HOW TO ORDER

Credit card buyers may order by calling our national toll-free number or any of the local numbers listed below. Or you may send your check or money order for $42.45 per unit ($39.95 plus $2.50 postage, insurance and handling—Illinois residents add 5% sales tax) to the address shown below. But act quickly! See for yourself how easy it is to keep your checkbook in perfect balance every day of the year. Order your CheckMaster at no obligation today.

ONE YEAR WARRANTY

CALL TOLL-FREE..... (800) 323-6400
In the State of Illinois call..... (312) 498-6900

In the San Francisco area call..... (415) 391-1700
In the New York City area call... (212) 964-0690
In Montreal Canada call..... (514) 332-9523
In Toronto Canada call..... (416) 445-8136
In Australia call..... Melbourne 53 5286

JS&A NATIONAL SALES GROUP
DEPT. SMI-6 4200 DUNDEE ROAD
NORTHBROOK, ILLINOIS 60062
(312) 564-9000 © JS&A Group, Inc., 1975

By H. Allen Smith

Adam bombs, moon dust, doom buggies

The time has come to quit shooting men off into orbit and planning excursions to Mars and other planets. Not because we need those billions of dollars here on Earth: It has to do with moon dust.

A quarter of a century ago, when they first started exploding atomic bombs hither and yon, I lived in the country in Mount Kisco near New York City and a lady named Hyacinth was our cleaning woman. She also became my personal weatherglass. I first became attracted to her meteorological wisdom when she said to me: "I don't think I'll wash the windows on the outside today. It's gonna pour down rain tomorrow."

I asked her how she knew.

"The dog's out there in the yard eating grass," she said. "Any time you see a dog eating grass, it's a sign it's gonna rain tomorrow." Next day, a frog-drownder.

She'd say: "I smell snow." Thirty minutes later, a blizzard.

Came the plague of ladybugs. Now, ladybugs are good for you—they devour garden pests—but coming in by the long ton was too much of a good thing. They covered the walls and the windowpanes and came down the chimney. Hyacinth tried to spray them and vacuum them to no avail; then she began sloshing ammonia around and that helped a little. And now, for the first time, she mentioned the "Adam" bomb and its effect on terrestrial affairs.

"They got to stop shooting off the Adam bomb," she said. "These ladybugs were blowed over here by the bombs."

"From where?"

"Out there," she said, waving a hand toward the southwest.

There were scourges and maladies other than the influx of ladybugs which, Hyacinth assured me, were brought on by the continuing nuclear explosions. She advised me to listen closely to the birds—they were all growing hoarse.

"The fish," she said, "got radium poison in their system from the bombs, and the birds been eating the fish, and they have become hoarse when they sing." More than that, down in Mount Kisco "funny lumps" were beginning to appear on the sidewalls of automobile tires. The Adam bomb. No question. "Over the far side of town," said Hyacinth, "this rich lady, Miz Phillips, has got to shave her upper lip every two days because ever since they started shooting off the bombs, she has grown a gray moustache."

Today I am living in a small cow town in the Southwest, a land with a lot of nature in it. And now I have Miss Myrt for my barometer and my medical guide. She is a bulky spinster with stringy hair that falls to her shoulders.

Miss Myrt carries a stout cane and as she walks along the streets she brandishes it in the air, and talks in low but emotional tones. She is not threatening any of her fellow townsmen with the cane, and she is not mumbling at them. Her gestures are a warning to the powers and principalities of the air, and her low-key sermons are an evangelical warning to the forces of nature—they are all to keep their distance from Miss Myrt. She talks to almost no one but Doc Tedd at Town Drug, and Doc sometimes tells me what she has to say.

Miss Myrt vanished from the streets for a while recently and word got around that she, in common with many other citizens, had caught the Port Chalmers flu. When she was able to resume her normal activities, she called on Doc Tedd and told him where the epidemic was coming from. Not Port Chalmers in New Zealand. Not Hong Kong.

"Moon dust," she said, swinging her cane in a wide arch and knocking over eight bottles of Elliman's Universal Embrocation. "Insane people goin' up in them rockets, stompin' and trompin' around, stirrin' up all that dust. We're all gonna die of double pneumonia with stomach cramps.

"Things are gonna get worse. The moon dust that's siftin' down on us now is from that Jack Armstrong and that big footstep for the common people. It takes a long time for moon dust to get all the way down to us. Just wait till we get the dust from all that golf-playin' on the moon, and doom buggies chargin' around. Phil Gorse over at Gulf told me yesterday that the bicycle tires in this town are breakin' out with welts and knots, and he thinks the disease will spread to automobile tires. Moon dust, for sure!"

Doc Tedd told me all this and then hit me with the clincher. Miss Myrt, he said, is growing a moustache. She has to shave it every two or three days and she blames it on the coming of the moon dust. It is a gray moustache.

I believe. Any time you get shock waves from the Adam bomb or moon dust overthrowing natural law, you've simply got to have faith. I have a suggestion to make:

Get the ammonia ready. The ladybugs are on their way.

Sometimes, a few simple words can straighten out a difficult problem. But making sure those words don't get distorted is anything but simple.

So we at Western Electric, using a Bell Labs design, make a unique device for Bell Telephone Companies everywhere. A device that lets you be sure that you always sound like you, whether you're calling across the street or across the country.

When someone wants his father to know he's welcome, we want to be sure his message comes through loud and clear.

We make your phone and the things that make it work.

Western Electric

We're part of the Bell System.
We make things that bring people closer.

ROYAL STREET in the Old NEW ORLEANS French Quarter
—and at 407 Royal Street is located RAYMOND H. WEILL Co.

Roger G. Weill · Raymond H. Weill

Universally Recognized Buyers and Builders of Great Stamp Collections